



Penn E&R
Environmental & Remediation, Inc.

July 31, 2020
PA008447-001

VIA FEDERAL EXPRESS AND ELECTRONIC MAIL

Ms. Patricia Murrow
U.S. Environmental Protection Agency, Region 7
Air and Waste Management Division
Waste Remediation and Permitting Branch
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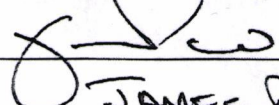
Subject: WDC Acquisition LLC – RCRA Facility Identification No. IAD065218737
Administrative Order on Consent (AOC), EPA Docket No. RCRA-07-2003-0167
Submission of Focused Corrective Measures Study Report (Revision 0)

Dear Ms. Murrow:

On behalf of WDC Acquisition LLC (WDC), Penn Environmental & Remediation, Inc. (Penn E&R) is submitting one copy of the subject report. The report is being submitted to partially address Task III of Attachment 3 to the subject AOC. The subject report addresses only Solid Waste Management Unit 12, Solid Waste Landfill, as opposed to the facility as a whole, per agreement with USEPA.

In accordance with Paragraph XIV (4 of 5) of the subject AOC, please find the document certification below.

I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to evaluate the information submitted. I certify that the information contained in or accompanying this submittal is true, accurate, and complete to the best of my knowledge. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared in accordance with procedures designed to assure that qualified personnel gathered and evaluated the information submitted. Based in my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: 

Name: JAMES PINTO

Title: CEO

Date: 07/29/2020

RCRA

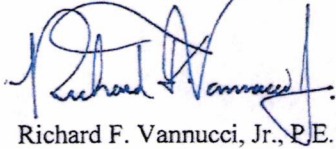


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Please contact me (412-722-2222) if you have any questions or would like to discuss this matter further.

Ms. Murrow
July 31, 2020
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Respectfully submitted,
PENN ENVIRONMENTAL & REMEDIATION, INC.

A handwritten signature in blue ink, appearing to read "Richard F. Vannucci, Jr.", is written over a horizontal line.

Richard F. Vannucci, Jr., P.E.
Chief Engineer

Enclosures

cc: M. Thelen/WDC
M. Leat/IDNR
C. Denton/B&T
M. Steger/CH

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**RCRA FOCUSED CORRECTIVE MEASURES STUDY
SOLID WASTE MANAGEMENT UNIT 12
SOLID WASTE LANDFILL**

**WDC ACQUISITION LLC
CRESTON, IOWA
RCRA FACILITY IDENTIFICATION
NO. IAD065218737**

**JULY 2020
REVISION 0**

Prepared For:

**WDC Acquisition LLC
1746 Commerce Road
Creston, Iowa**

Project No.: PA008447

Prepared By:

**Penn Environmental & Remediation, Inc.
111 Ryan Court
Pittsburgh, PA 15205**



Penn E&R
Environmental & Remediation, Inc.

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APPENDICES

- A Iowa Department of Natural Resources Sanitary Permit No. 88-SDP-04-86P, issued September 6, 2018, revised September 27, 2019
- B Closure/Postclosure Plan, Solid Waste Landfill Permit Application Form 50 with Supporting Documentation, Permit Renewal for Permit No. 88-SDP-04-86P, WDC Acquisition LLC, by Penn Environmental & Remediation, Inc., August 2018
- C Closure/Postclosure Cost Estimates, WDC Acquisition LLC, by Penn Environmental & Remediation, Inc., March 2020
- D Proposed Borrow Area Investigation, WDC Acquisition LLC, by Penn Environmental & Remediation, Inc., June 2020

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1.0 INTRODUCTION

At the request of WDC Acquisition LLC (WDC), Penn Environmental & Remediation, Inc. (Penn E&R) has prepared this Focused Corrective Measures Study (Focused CMS) Report for Solid Waste Management Unit (SWMU) 12, Solid Waste Landfill, at the subject facility. The submission of this Focused CMS Report originated with an April 1, 2020 e-mail request to the U.S. Environmental Protection Agency (USEPA) from Penn E&R, on behalf of WDC. In the e-mail, Penn E&R asked if USEPA would approve the use of an Iowa Department of Natural Resources (IDNR) compliant final cover system over SWMU 12 with the understanding that, barring unforeseen circumstances, no further corrective action for SWMU 12 would be required by USEPA. Penn E&R also explained that WDC was obligated under the terms and conditions of IDNR Sanitary Permit No. 88-SDP-04-86P (Permit), specifically Special Provision No. 7, to close and cover the industrial waste landfill with an IDNR compliant final cover system when final waste grades are reached (currently expected within 24 months). On May 11, 2020, USEPA responded to WDC via e-mail and letter. The letter noted that USEPA cannot render remedy decisions without a CMS evaluation. USEPA must then document subsequent remedy decisions in a Statement of Basis and administrative record and solicit feedback from the public. USEPA would consider any public comments prior to a final remedy decision.

The 2003 Administrative Order (2003 AO), as amended in 2018, between WDC and USEPA describes the need for a comprehensive CMS covering all SWMUs and Areas of Concern (AOCs) associated with the ongoing Resource Conservation and Recovery Act (RCRA) Corrective Action for the facility. However, the May 11, 2020 USEPA letter suggested USEPA would consider a Focused CMS Report evaluating potential options for corrective action for the landfill SWMU alone. This would allow USEPA to follow the required path described above to make a final remedy decision for the landfill unit within the IDNR Permit closure timeframe. USEPA's suggestion was discussed at length between the interested parties during a conference call on May 20, 2020. The results of this conference call were summarized in letter from WDC to USEPA dated May 20, 2020 and confirmed by USEPA e-mail to WDC dated May 26, 2020.

Based on USEPA requirements, the Focused CMS for the landfill unit will proceed as follows:

- The Focused CMS will be specific to the solid waste landfill, identified as SWMU 12 in the 2003 AO;
- The Focused CMS will be completed and the report issued to USEPA prior to the RCRA Facility Investigation (RFI) Report final approval; however the RFI Report was submitted to USEPA in January 2020 and is currently under review;
- The Focused CMS does not require a CMS Workplan; and
- The Focused CMS Report will follow the substance of the 2003 AO and all applicable guidance excluding the conditions described above.

This Focused CMS Report is organized as follows. Chapter 1.0 is the Introduction. Chapter 2.0 discusses Corrective Action Objectives. Chapter 3.0 identifies corrective action alternatives. Chapter 4.0 provides the evaluation of the possible alternatives. Chapter 5.0 presents the justification for the selection of the recommended alternative.

2.0 CORRECTIVE ACTION OBJECTIVES

Attachment 3 of the 2003 AO describes the required elements of a CMS Report. Specifically, Section III of Attachment 3 specifies the need for Corrective Action Objectives (CAOs). Although Attachment 3 described the elements of a comprehensive CMS for the site as a whole, Penn E&R has attempted to follow the same requirements for this Focused CMS Report for SWMU 12. As a result, the following narrative discusses the CAO developed for this Focused CMS.

Penn E&R has reviewed the guidance regarding the development of CAOs in the RCRA Facilities Investigation Remedy Selection Track (FIRST), A Toolbox for Corrective Action, by USEPA dated May 20, 2016. Specifically, RCRA FIRST Tool 7 discusses the CAOs. In that reference, CAOs for remedy selection are defined as, "...medium-specific or unit-specific goals that a cleanup alternative must achieve to protect human health and the environment. These objectives should be as specific as possible, but not so specific that the range of alternatives that can be developed is unduly limited."

As stated in RCRA FIRST Tool 7:

CAOs should specify the following:

1. The contaminant(s) of concern (COCs),
2. The exposure route(s) and receptor(s), and
3. An acceptable contaminant level or range of levels for each exposure route.

CAOs are developed from:

1. USEPA law, policy, and guidance,
2. Threshold criteria: protect human health and the environment, achieve media cleanup objectives, control sources,
3. Conceptual Site Model,
4. Current uses and exposures,
5. Reasonably-expected future uses and exposures, and
6. Resource values (ecological, groundwater, etc.)

The waste material in SWMU 12, the Solid Waste Landfill, is currently being mined for off-site beneficial use as daily cover material at the South Central Iowa Sanitary Landfill. WDC has also been accumulating and transporting waste materials generated from ongoing operations that were destined for disposal in the on-site landfill for the same off-site beneficial use. These ongoing arrangements for this solid waste material are consistent with the low hazard characteristics of the waste. The current IDNR Permit allows for this off-site beneficial use with the condition that site activities must result in an ongoing net removal of waste from the landfill.

An additional condition of the IDNR Permit is that closure activities must begin when final projected waste grades as defined in the Permit are reached. In general, these final waste grades match the existing perimeter limit-of-waste grades to: allow for the placement of an IDNR compliant final cover system; maximize the amount of waste material removed from the landfill footprint; and to blend with the existing topography in the area. The final cover system is

specified under Iowa Solid Waste Regulations and within the terms and conditions of the Permit (**Appendix A**). Specifically the requirements listed in the Closure and Postclosure Plan (**Appendix B**) submitted as part of the permit renewal application are now Permit conditions.

Waste materials not excavated for off-site beneficial use will remain on-site as per the IDNR Permit. Although the landfilled material was placed on relatively impervious soils, the landfill does not possess an engineered liner system, as allowed by the regulations in effect at the time of original construction. The near surface groundwater table within the projected landfill perimeter intercepts the waste mass at varying depths (~3-8 feet) above the landfill base, based on available groundwater elevation data. The groundwater table flows horizontally across the site in a southeasterly direction and is intercepted by the existing Leachate Collection System (LCS). As a result, it is considered impracticable and unnecessary to remove the saturated waste materials from the landfill. The difficulties associated with larger scale remediation of saturated waste materials (dewatering the excavation, water management, waste material drying, mobilization of contaminants in groundwater, off-site transport of contaminants during the remediation, excavation instability, worker safety, etc.) outweigh the limited potential environmental benefits.

Because waste materials will remain, the medium-specific goals will include goals for containing the waste material. Other media requiring consideration include groundwater and surface water potentially impacted by the landfill waste materials. Soil and air (indoor) are not considered to be applicable media for consideration at this SWMU.

COCs associated with the waste materials, the associated leachate, and the potentially impacted groundwater and surface water have been discussed in previous submissions as part of the ongoing RCRA Correction Action. The comprehensive list of COCs covering the identified media is as follows:

- Aluminum, arsenic, barium, beryllium, boron, cadmium, chloride, chromium, cobalt, copper, fluoride, iron, lead, lithium, magnesium, manganese, nickel, nitrate/nitrite-N, silver, sodium, strontium, sulfate, tin, zinc, vanadium, benzene, 1,1-dichloroethane, cis-1,2-dichloroethene, 1,3,5-trimethylbenzene, vinyl chloride, and xylenes

Each of these parameters has been detected above screening levels or detected in notable concentrations in one of the specified media. The RFI Report, submitted in January 2020, discusses the applicable contaminants of concern in more detail in Sections 4.2 and 5.4.

As a result of the evaluation completed above, Penn E&R has developed the following list of CAOs for SWMU 12:

Solid Waste Media CAO:

- Prevent the direct contact/ingestion/inhalation of solid waste by on-site and construction workers and ecological receptors to identified COCs. The priority/time frame of the corrective action is short term for on-site workers and ecological receptors; and intermediate to long term for construction workers and ecological receptors; the point of compliance is the limit of waste; and the cleanup levels are soil screening or background levels.

Groundwater Media CAO:

- Prevent the direct contact/ingestion of potentially impacted groundwater by on-site workers, construction workers, off-site residents, and ecological receptors to identified COCs. The priority/time frame of the corrective action is intermediate to long term for all receptors (groundwater not currently used/contacted on- or off-site); the point of compliance is the limit of identified groundwater impacts; and the cleanup levels are maximum contaminant levels (MCLs) or screening levels.

Surface Water Media CAO:

- Prevent the direct contact/ingestion of potentially impacted storm water by on-site workers, construction workers, off-site residents, and ecological receptors to identified COCs. The priority/time frame of the corrective action is short term for on-site workers and ecological receptors; and intermediate to long term for construction workers and off-site residents; the point of compliance is the property line, particularly at the southeast corner of the landfill; and the cleanup levels are maximum contaminant levels (MCLs) or screening levels.

These CAOs have been used to identify and evaluate the corrective measure alternatives evaluated in this Focused CMS.

3.0 IDENTIFICATION OF CORRECTIVE MEASURE ALTERNATIVES

Based on the RFI results, discussions with USEPA and IDNR leading to this report, and an assessment of available and proven remedial technologies for solid waste landfills, Penn E&R has identified the following corrective measure alternatives for SWMU 12:

1. No action; and
2. Installation of an IDNR compliant final cover system, with implementation of the IDNR Permit specified Closure/Postclosure Plan.

Alternate No. 1 is typically identified as a benchmark alternative against which all other alternatives are evaluated. To clarify, Alternative No. 1 means that the solid waste in the landfill will be mined to reach final waste grades as specified in the Permit and then the waste will remain permanently exposed over the entirety of the landfill footprint without additional controls, except as specified below.

Alternative No. 2 is considered in this context to be the default corrective action for SWMU 12. The “default” designation has been applied because the current Permit requires that the landfill be closed with the installation of an IDNR compliant final cover system when the final designated waste grades are reached as a result of ongoing waste excavation activities. The remainder of the approved Closure/Postclosure Plan, as included in the Permit, will then be implemented. Further details regarding Alternative No. 2 are provided in the following sections.

It should be noted that both of the identified alternatives include supplemental measures to achieve the CAOs, including perimeter fencing, site security, ongoing groundwater monitoring, continuing Leachate Control System (LCS) operation and maintenance activities, and an Environmental Covenant preventing access to site media. The supplemental measures are currently in place, with the exception of the Environmental Covenant, and are legally imposed by the IDNR Permit and the Environmental Settlement Agreement (ESA), as revised and amended dated June 9, 2020. The primary difference between the two alternatives is the presence of the IDNR compliant final cover system and the ongoing monitoring and operation and maintenance of the same to limit infiltration of rainwater through the remaining solid waste and protect against direct contact with that in-place solid waste.

4.0 EVALUATION OF CORRECTIVE MEASURE ALTERNATIVES

4.1 Protect Human Health and the Environment

Alternative No. 1:

This alternative does not protect human health and the environment because the waste will remain exposed allowing for possible on-site contact/intrusion and off-site waste material transport. In addition, potential groundwater and surface water impacts due to vertical leachate transmission and surface water discharges are not mitigated beyond the current leachate collection system.

Alternative No. 2:

The installation of the IDNR compliant final cover system will be protective of human health and the environment by isolating the waste mass from receptor direct contact exposure and preventing precipitation from contacting the waste and transporting waste and/or leachate beyond the limit of waste. The IDNR cover system consists of 2 feet of low permeability soils covered by 2 feet of soil cover designed to both protect the low permeability soils and promote vegetative growth.

The cover system will also help mitigate impacts to near surface groundwater beneath and downgradient of the landfill footprint, which is already limited in concentration and extent of contamination. Historically, the majority of the landfill surface has been exposed to allow for free access to the working face, given the industrial classification of the waste materials. When the IDNR compliant final cover system is in place, the infiltration of precipitation through the waste mass will be mitigated and the volume of leachate collected by the perimeter LCS should decrease. The LCS will continue to intercept groundwater that flows horizontally through the waste mass at the base landfill as described in **Section 2.0**. Penn E&R anticipates this will lead to an improvement in groundwater quality since the source waste material above the water table will be isolated from precipitation and can no longer contribute contaminants to groundwater via infiltration generated leachate.

4.2 Attain Media Cleanup Standards Set by the Implementing Agency

Alternative No. 1:

This alternative does not attain media cleanup standards because the waste will remain exposed. The lack of a cover system as an engineering control means the waste materials present within the landfill footprint will exist at contaminant levels above soil screening or background levels with no barrier between the waste and potential human receptors. This scenario also allows for potential exceedances of storm water and groundwater cleanup standards since the waste mass is not isolated from precipitation.

Alternative No. 2:

The installation of the IDNR compliant final cover system will attain the cleanup standards for the waste media present in the landfill since the media will be isolated from potential human receptors with no potential for direct contact, ingestion, or inhalation. The waste media will also be isolated from precipitation which can generate exceedances of associated media cleanup

standards for both surface water and groundwater. However, the base of the waste mass will still be in contact with shallow groundwater as described in **Sections 2.0** and **4.1**, but the potential for impacted groundwater is addressed by the leachate collection system operation and maintenance. It should also be noted that there are no on-site human receptors for this groundwater, and that groundwater quality should improve in the intermediate and long term by installation of the cover system and the required continued operation of the LCS until such time as determined unnecessary, based on future evaluations of effectiveness. The nonattainment of groundwater cleanup standards on-site in the short term is not considered to be significant in this circumstance due to the lack of a completed receptor pathway as discussed in the RCRA Facility Investigation (RFI) Report.

4.3 Control the Source of Releases

Alternative No. 1:

This alternative does not control the source of releases because the waste will remain exposed allowing for possible on-site contact/intrusion and potential off-site waste material transport. In addition, potential groundwater and surface water impacts due to vertical leachate transmission and surface water discharges are not mitigated.

Alternative No. 2:

The installation of the IDNR compliant final cover system controls the source of the potential contaminant releases by isolating the waste mass from receptor exposure and preventing precipitation from contacting the waste and potentially transporting waste and/or leachate beyond the limit of waste. However, the base of the waste mass will still be in contact with groundwater as described in **Sections 2.0** and **4.1**. This limitation is considered to be manageable and acceptable as discussed in **Sections 4.1** and **4.2**.

4.4 Comply with any Applicable Standards for Management of Wastes

Alternative No. 1:

This alternative does not comply with the applicable standards for the management of waste because the IDNR Regulations for Sanitary Landfill: Industrial Monofills (567 IAC Chapter 115) are not satisfied. Specifically, the regulations require landfill operators to execute an approved Closure/Postclosure Plan as part of a Sanitary Permit issued specifically for the subject landfill. This plan requires that an IDNR compliant final cover system be installed over the waste when final waste grade are reached.

Alternative No. 2:

The installation of the IDNR compliant final cover system complies with the applicable standards for the management of waste. In addition, the approved Closure/Postclosure Plan included by reference in Special Provision No. 7 of the IDNR Permit meets applicable regulatory requirements. The Closure/Postclosure Plan includes the approved Hydrologic Monitoring System Plan and Leachate Control System Plan.

4.5 Other Factors for Selecting the Final Remedy

4.5.1 Long-term Reliability and Effectiveness

Alternative No. 1:

This alternative is neither reliable nor effective since no further action is taken.

Alternative No. 2:

The IDNR compliant final cover system (layered soils with vegetation) is considered to be highly reliable and effective in the long term, with minimal risk of failure. Cover system technology is universally applied to landfills, proven to function, relatively simple to construct, and is not readily compromised. Operation and maintenance of the cover system (*i.e.*, routine inspections, mowing, erosion and sedimentation repair, etc.) is considered to be straight forward and does not require specialized skill to complete. The projected life of the cover system is indefinite with proper care (inspection and maintenance).

4.5.2 Reduction in Toxicity, Mobility, or Volume of Wastes

Alternative No. 1:

This alternative does not reduce toxicity, mobility, or volume of wastes since no further action is taken.

Alternative No. 2:

The IDNR compliant final cover system substantially reduces the remaining wastes' inherent potential to cause future environmental releases or other risks to human health and the environment. The cover system will encapsulate the remaining waste material and therefore mitigate waste mobility. The toxicity and volume of the waste within the landfill will remain constant, but will be isolated.

4.5.3 Short-term Effectiveness

Alternative No. 1:

This alternative is not effective in the short term since no further action is taken.

Alternative No. 2:

The installation of an IDNR compliant final cover system should be effective in the short-term, and the construction activity should not be a concern since the facility is not located in a densely populated area and the waste characteristics do not pose a high risk to site workers and the environment. The cover system can be constructed relatively quickly with conventional equipment and limited risk.

4.5.4 Implementability

Alternative No. 1:

This alternative can be implemented easily since no action is taken.

Alternative No. 2:

The installation of the IDNR compliant final cover system can be implemented with minimal difficulty. Several factors were considered in this determination:

1. The installation of the cover system has already been approved by the applicable governing agency (IDNR) through the issuance of the existing Permit. WDC is also required to execute an Environmental Covenant pursuant to Iowa Code Chapter 455I entitled the Uniform Environmental Covenants Act to comply with 567 IAC 115.27(9)(d). The Environmental Covenant provision is also referenced as part of the existing ESA between environmental agencies and WDC. Environmental covenants are commonly used and usually require minimal time and effort to execute.
2. The cover system can be constructed with commonly available materials, construction equipment and labor. The installation should require no more than one construction season to complete and once finished, will provide immediate beneficial results.
3. The availability of adequate resources to construct the cover system should not be an issue, pending confirmation of the projected borrow source located on WDC property directly north of the landfill. Based on available information documenting the nature and extent of the soils located in the projected borrow area, adequate soils are present. In the unlikely event the borrow area cannot provide sufficient or adequate soil for the cover system, then WDC will pursue offsite borrows as needed. This circumstance should not impact project implementability.
4. The technology associated with the final cover system and its construction are readily available.

4.5.5 Cost

Alternative No. 1:

The no action alternative will have no cost relative to Alternate No 2. In this study, Penn E&R has assumed for the purpose of comparison that both Alternate No 1 and 2 have costs associated with the supplemental measures to achieve the CAOs, including perimeter fencing, site security, ongoing groundwater monitoring, continuing Leachate Control System (LCS) operation and maintenance activities, and an Environmental Covenant preventing access to site media.

Alternative No. 2:

Penn E&R has generated costs estimates for both the closure and postclosure activities specified by the Permit for the landfill. These costs are updated annually as part of the IDNR financial assurance requirements to reflect changes in the time value of money and other current considerations. The most current cost estimates are presented in **Appendix C**. The cost estimates include both capital and operation and maintenance expenses as well as professional fees and contingencies.

5.0 JUSTIFICATION AND RECOMMENDATION OF CORRECTIVE MEASURE

5.1 Description and Rationale

The recommended corrective measure alternative for SWMU 12, Solid Waste Landfill is Alternative No. 2, Installation of IDNR Compliant Final Cover System. As stated in **Section 4.1**, the cover system consists of 2 feet of low permeability soils covered by 2 feet of soil cover designed to both protect the low permeability soils and promote vegetative growth.

This determination has been made based on the following considerations:

1. The recommended alternative is considered to be the default alternative since the existing Permit requires the installation of the specified IDNR compliant final cover system;
2. The identified CAOs are largely satisfied, with the exception that waste materials will remain in contact with groundwater. However this limitation is mitigated by the continued operation and maintenance of the LCS and ongoing groundwater monitoring.
3. Penn E&R's review of the evaluation criteria supported the selection of Alternative No. 2 over the Alternative No. 1, as described and presented in Section 4.0.

5.2 Performance Expectations

The IDNR compliant final cover system will provide a sustainable and permanent barrier between potential receptors and the remaining waste materials. This barrier, with proper care and maintenance, will last indefinitely considering it will be constructed of native materials and will be covered with vegetation appropriate for erosion and sedimentation control. Storm water runoff will be controlled and directed around and over the cover system to prevent soil loss. Precipitation infiltration to the waste mass will be mitigated by the placement of the 2 feet thick low permeability soil layer.

5.3 Preliminary Design Criteria and Rationale

The Closure/Postclosure Plan for the landfill is presented in **Appendix B**. The plan describes the applicable design criteria for the IDNR compliant final cover system. A summary of the specified design criteria and the associated rationale, if not self-explanatory, is as follows:

1. The owner or operator of the landfill must close the site in a manner that minimizes the potential for postclosure release of pollutants to the air, groundwater or surface waters. [567 IAC 115.26(13)]
2. A minimum of two permanent surveying monuments must be installed by a registered land surveyor from which the location and elevation of wastes, containment structures, and monitoring facilities can be determined throughout the post-closure period. [567 IAC 115.26(13)a]
3. The final cover of a non-municipal solid waste landfill shall consist of:
 - a. Not less than 2 feet of compacted soil. The permeability must be 1×10^{-7} cm/sec or less as determined by appropriate laboratory analysis. The percent of standard or modified proctor density at moisture content consistent with expected field conditions and corresponding to a measured coefficient of permeability equal to

- or less than 1×10^{-7} cm/sec shall be determined in the laboratory. The soil shall be placed in lifts not to exceed 8 inches in thickness. A minimum of one field density test shall be performed per lift per acre to verify that the density determined by the laboratory analysis as correlated to permeability has been achieved. Results of field density tests shall be submitted to the department. The compacted soil shall be keyed into the bottom liner at the waste cell boundary. [567 IAC 115.26(13)b(1)] (The rationale for the placement of this layer is to prevent precipitation infiltration to the remaining waste mass and to provide a barrier between the waste mass and potential receptors.)
- b. Not less than 2 feet of uncompacted soil, containing sufficient organic matter to support vegetation. The thickness of this soil layer must be at least the root depth of the planned vegetative cover to prevent root penetration into the underlying soil layers. This layer shall be placed as soon as possible to prevent desiccation, cracking and freezing of the compacted soil layer described in 115.26(13)b(1). [567 IAC 115.26(13)b(2)] (The rationale for the placement of this layer is to protect the low permeability layer below, promote vegetative growth for erosion and sedimentation control and evapotranspiration of precipitation, and to provide a barrier between the waste mass and potential receptors.)
 - c. A layer of compacted soil, incinerator ash, or similar material permitted by the department may be used to prepare the site for placement of the compacted soil layer described in 115.26(13)b(1). The use of such material will not serve as a replacement for the compacted soil layer described in 115.26(13)b(1). [567 IAC 115.26(13)b(3)] (Unnecessary in this circumstance, not applicable.)
- 4. The final cover shall be designed and graded to meet the drainage requirements of 115.26(1)f. The final cover must have a minimum slope of 5 percent, and shall not exceed a slope of 25 percent. [567 IAC 115.26(13)e] (The rationale for this provision is to promote storm water runoff, with limited flow velocity. Removal of storm water from the cover system prevents ponding and saturated soils which are detrimental to the viability of the cover system soils. Higher storm water runoff velocities cause erosion and sedimentation, which are also detrimental to cover system viability.)
 - 5. The final cover shall be seeded with native grasses or other suitable vegetation as soon as practicable upon completion to prevent soil erosion. If seeding must be delayed due to summer or winter conditions, silt fences or other structures shall be used to minimize erosion of the final cover until the next season suitable for planting. The placement of cover in conformance with 115.26(13)b and c shall not be delayed due to season and shall be placed as soon as the solid waste has reached its maximum design elevation within the cell. Vegetation type shall be based on density and root depth, nutrient availability, soil thickness, and soil type. Alternatives to vegetative cover may be considered to control erosion and promote runoff. [567 IAC 115.26(13)f]

5.4 General Operation and Maintenance Requirements

The IDNR compliant final cover system must be periodically maintained in order to be stable and viable for the long term. Also, the supplemental measures referenced in **Section 3.0** of this report require ongoing operation and maintenance. These supplemental measures include operation and maintenance of the hydrological monitoring system and the LCS.

General operation and maintenance requirements of these systems (postclosure requirements for 30 years following closure of the site) include the following:

1. Final Cover System:
 - a. The diversion and drainage system as required in 115.26(1)f must be maintained to approved specifications to prevent runoff and runoff from eroding or otherwise damaging the final cover. [567 IAC 115.26(14)a]
 - b. The integrity and effectiveness of the final cover must be maintained by making repairs as necessary to correct the effects of settling, subsidence, erosion, or other events. If damage to the compacted soil layer described in 115.26(13)b(1) occurs, repairs shall be made to correct the damage and return it to its original specifications. [567 IAC 115.26(14)b]
 - c. The vegetative cover shall be reseeded as necessary to maintain good vegetative growth. Any invading vegetation whose root system could damage the compacted soil layer shall be removed or destroyed immediately. [567 IAC 115.26(14)c]
 - d. The permanent surveying monuments required in 115.26(13)a shall be maintained. [567 IAC 115.26(14)g]
2. Hydrologic Monitoring System:
 - a. Repair and replacement of groundwater monitoring wells components and integral sampling pumps as necessary.
3. Leachate Control System:
 - a. Cleaning, repair and replacement of LCS components:
 - i. Lateral collection and gathering piping east and south of the landfill;
 - ii. Collection sump including sump structure, sump pump and associated floats and valves;
 - iii. Transfer piping and fixtures from sump to collection tank; and
 - iv. Collection tank and ancillary bag filters.
 - b. Discharge permit compliance.

5.5 Long-term Monitoring Requirements

The systems described in **Section 5.4** must be periodically monitored or inspected to recognize, evaluate, and document current site conditions. Ongoing observations will dictate the need for corrective action in the form of cleaning, repairs or replacement of system components.

Long-term monitoring requirements of these systems (post-closure requirements for 30 years following closure of the site) include the following:

1. Final Cover System:
 - a. Semiannual inspections to evaluate:
 - i. Vegetation condition and coverage including the presence of invading species;
 - ii. Soil condition including the presence of erosion and sedimentation, disturbance due to boring vectors, desiccation, saturation, etc.;

- iii. Cover system condition including ponding, settlement, and subsidence;
and
 - iv. Collection and diversion channel condition.
2. Hydrologic Monitoring System:
- a. Semiannual monitoring:
 - i. Groundwater sampling and analyses;
 - ii. Groundwater elevations; and
 - iii. Groundwater monitoring well condition and functionality;
3. Leachate Control System:
- a. Semiannual inspections:
 - iv. Lateral collection and gathering piping east and south of the landfill;
 - v. Collection sump including sump structure, sump pump and associated floats and valves;
 - vi. Transfer piping and fixtures from sump to collection tank; and
 - vii. Collection tank and ancillary bag filters.
 - b. Discharge permit compliance.

Semiannual reports shall be submitted to IDNR. These reports shall contain information concerning the general conditions at the site, groundwater monitoring results, amount of leachate collected and treated, information concerning the LCS, and other information as may be required by the Permit. The reports are due by April 30 and October 31 for the preceding six-month period. [567 IAC 115.26(14)g]

5.6 Design and Implementation Precautions

5.6.1 Special Technical Problems

No special technical problems are anticipated with the implementation of the recommended alternative.

5.6.2 Additional Engineering Data Required

Additional engineering data is needed to confirm the nature and extent of the soils located in the proposed borrow area. The IDNR compliant final cover system requires soils of specific types in order to construct both the 2 feet thick low permeability layer and the 2 feet thick protective cover layer to be placed over the remaining waste mass. At WDC's request, Penn E&R has prepared a sampling and analysis plan to investigate the soils in the proposed borrow area to confirm the soils will be acceptable for construction. The proposed plan is presented as **Appendix D**. Penn E&R anticipates that WDC will complete the investigation sometime in 2020, well in advance of the proposed cover system construction.

5.6.3 Permits and Regulatory Requirements

The permit and regulatory requirements for the design and construction of the proposed IDNR compliant final cover system have been discussed elsewhere in this report, specifically in **Sections 4.4, 5.3 and 5.4 and 5.5**.

5.6.4 Access, Easements, Right-of-Way

Contractors working on behalf of WDC to construct the IDNR compliant final cover system should have free and open access to the landfill site and ancillary areas such as the proposed borrow area location to the immediate north of the landfill. WDC owns and operates the property with no anticipated restrictions. It is possible some supplemental earthwork may be required in the right-of-way located along the west side of South Osage Street, running north and south to the immediate east of the landfill. In the event work is required in the right-of-way, WDC will coordinate with the local authorities to obtain permission well in advance of any proposed activities.

5.6.5 Health and Safety Requirements

WDC will require that contractors involved in the construction of the IDNR compliant final cover system comply with applicable regulations and standard practices required under OSHA. A site specific Health and Safety Plan will be generated by the selected contractor for submittal to and approval by USEPA prior to onsite construction activities.

5.6.6 Community Relations Activities

In general accordance with the Community Relations Plan, October 2006, Revision 1, WDC anticipates that USEPA will provide the public with the opportunity to review and comment on the final draft of this Focused CMS Report.

5.7 Cost Estimates and Schedules

5.7.1 Capital and Operation and Maintenance Cost Estimates

Cost estimates to implement, operate and maintain the recommended corrective measure are presented in **Appendix C**. A postclosure period of 30 years was used per 567 IAC 115.26(14).

5.7.2 Project Schedule

WDC anticipates that the recommended alternative will be constructed during the 2022 construction season. This schedule is highly dependent on many factors and will be revised as necessary as more information becomes available.

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APPENDIX A



June 17, 2019

PA0007983

Con 12-1-1
Doc # 95396

MATT THELEN
WELLMAN DYNAMICS CORPORATION
1746 COMMERCE ROAD
CRESTON, IA 50801

RE: Wellman Dynamics Corporation Landfill
Permit Revision #2
Permit #88-SDP-04-86

Dear Mr. Thelen:

Attached is a revised permit for the WDC Acquisition Industrial Landfill. The permit and the approved plans must be kept at the sanitary disposal project in accordance with 567 IAC 115.26(2)'c'. Please review the permit with your operators, as they must become familiar with it.

The permit was revised to require delivery of a copy of the Annual Water Quality Report to the EPA RCRA Project Manager (special provision #4h).

Note that the permit contains special provisions that may require a response or action by you, which, if not properly complied with, may prompt enforcement action by the DNR.

If you have any questions, please contact me at (515) 725-8345.

Sincerely,

Michael B. "Mick" Leat
Land Quality Bureau

cc: Richard F. Vannucci, Jr., P.E.
Penn Environmental & Remediation, Inc.
100 Ryan Court, Suite 100
Pittsburgh, PA 15205

Field Office 4

Patricia Murrow
AWMD/WRAP
EPA Region 7
11201 Renner Blvd
Lenexa, KS 66219

IOWA DEPARTMENT OF NATURAL RESOURCES
SANITARY DISPOSAL PROJECT PERMIT
FOR INDUSTRIAL MONOFILLS

- I. Permit Number: 88-SDP-04-86P
- II. Permitted Agency: WDC Acquisition Industrial Landfill
- III. Project Location: Part of the SE ¼, NE ¼, Section 7, T12N, R30W,
10 Acres, Union County, Iowa

IV. Responsible Official

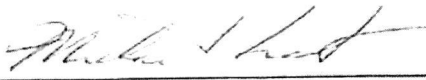
Name: Danette Grim, President
Address: WDC Acquisition LLC
1746 Commerce Road
Creston, IA 50801
Phone: (641)782-0310
FAX: (641)782-0386

V. Licensed Design Engineer

Name: Richard F. Vannucci, Jr., P.E.
Address: Penn Environmental & Remediation, Inc.
100 Ryan Court, Suite 100
Pittsburgh, PA 15205
Phone: (412)722-1222
FAX: (412)722-1244
Iowa License Number: 16427

- VI. Date Permit Issued: September 6, 2018
Date 2nd Permit Revision: June 17, 2019

- VII. Permit Expiration Date: September 6, 2021

- VIII. Issued by: 
Department of Natural Resources

IX. General Provisions

The above named permitted agency is hereby authorized to operate a sanitary disposal project at the described location in conformance with Iowa Code section 455B, the rules pursuant thereto existing at the time of issuance, and any subsequent new rules which may be duly adopted, and any provisions contained in Section X of this permit.

The issuance of this permit in no way relieves the applicant of the responsibility for complying with all other local, state, and federal statutes, ordinances, and rules or other requirements applicable to the establishment and operation of this sanitary disposal project.

No legal or financial responsibility arising from the construction or operation of the approved project shall attach to the State of Iowa or the DNR due to the issuance of this permit.

If title to this project is transferred, the new owner must apply to the DNR for a transfer of this permit within thirty days of the date of title transfer pursuant to rule 115.9. This permit is void sixty days after the date of title transfer unless the DNR has transferred the permit.

The permit holder shall file a Quarterly Solid Waste Fee Schedule and Retained Fee Report utilizing the DNR's Form 542-3276 and tonnage fee payment, as applicable, for all wastes disposed at the sanitary disposal project in accordance with Iowa Code section 455B.310. The Reports will be due January 1, April 1, July 1 and October 1 for the quarters ending September 30, December 31, March 31, and June 30, respectively. The permit holder shall mail the completed report to the Solid Waste Section, Wallace State Office Building, 502 East Ninth Street, Des Moines, Iowa 50319. This reporting procedure supersedes any previous conflicting permit provisions.

The permit holder shall weigh all solid waste collection vehicles and solid waste transport vehicles on a scale certified by the Iowa Department of Agriculture and Land Stewardship. If conditions are such that make it impractical to provide an on-site scale, then off-site scale facilities or an alternative method of calculating the tonnage disposed, may be used if justified and approved by the DNR. The permit holder shall comply with the waste weighing, record keeping and tonnage fee reporting requirements defined in rule 101.14(455B,455D). The scale weighing facilities shall comply with the certification and licensing requirements of the Iowa Department of Agriculture and Land Stewardship at all times. The permit holder shall maintain a current copy of the weighing scale facility licensing certificate issued by the Iowa Department of Agriculture and Land Stewardship at all times.

This facility shall be staked as necessary and inspected on a semiannual basis by a professional engineer licensed in the State of Iowa. The engineer shall prepare a brief report describing the site's conformance and nonconformance with the permit and the approved plans and specifications during the inspections. These reports shall be submitted by April 30 and October 31 each year to the DNR's Main and local Field offices. The DNR shall be notified if any inspection reveals any nonconformance with the permit and approved plans and specifications.

The permit holder shall ensure that the sanitary disposal project does not (1) cause a discharge of pollutants into waters of the United States, including wetlands, that violates any requirements of the Clean Water Act, including, but not limited to, the National Pollutant Discharge Elimination System (NPDES) requirements, pursuant to Section 402 of the Clean Water Act, and (2) cause the discharge of a nonpoint source of pollution into waters of the United States, including wetlands, that violates any requirement of an areawide or statewide

water quality management plan that has been approved under Section 208 or 319 of the Clean Water Act.

The permit holder shall submit an updated Sanitary Landfill Financial Assurance Report Form no later than April 1st, annually, pursuant to rule 115.31(455B). Use of this form provides permit holders a uniform means of submitting all required documentation to ensure that closure and postclosure cost estimates and applicable financial assurance instruments are updated as required.

Failure to comply with Iowa Code Chapter 455B, or any rule of order promulgated pursuant thereto, or any or all provisions of this permit may result in 1) a civil penalty of up to \$5000 for each day of violation, pursuant to Iowa Code section 455B.307, or 2) the suspension or revocation of this permit, pursuant to Iowa Code section 455B.305.

X. Special Provisions

1. The permit holder is authorized to accept foundry sand waste, baghouse/dust collector wastes, and treated magnesium dross waste generated by WDC Acquisition LLC in Creston, Iowa for disposal. Wastes disposed at this site shall not exhibit free liquids, toxic or hazardous properties. No hazardous wastes as defined by Iowa Code section 455B.411 may be disposed at this landfill.

In addition, the permit holder may use the workface as a drying/staging area for the waste material prior to removal from the site during exhumation activities.

2. The permit holder shall develop and operate the site in accordance with the hereby approved Sanitary Disposal Project Permit Application (doc#92968, Permit Application), dated August 15, 2018, as submitted by Penn Environmental & Remediation, Inc., and the following:
 - a. Waste disposal is limited to the existing waste boundary as shown on Figure 1 as contained in Appendix 9 of the Permit Application. Any further expansion beyond this waste boundary shall require prior DNR approval.
 - b. The permit holder is authorized to exhume waste foundry sand and foundry composite wastes for reuse in accordance with the removal procedures contained in Appendices 3, 8, and 9 of the Permit Application.

Care must be taken to drain excessive surface water ponding in the fill areas in order to minimize infiltration to groundwater, as generated leachate is not contained by an engineered liner or collected in a leachate collection system that underlies the entire disposal area, and groundwater contamination from the landfill has been documented. Failure to minimize ponding of surface waters in the fill areas may result in revocation of DNR Field Office #4's June 18, 2004 approval to forgo daily or intermediate cover, or the imposition of additional requirements to minimize infiltration.

The exhumation operations shall be conducted such that the permit holder maintains positive drainage at all times during the exhumation process. Dust shall be controlled at all times.

In addition, the permit holder may use the workspace as a drying/staging area for the treated magnesium dross wastes prior to removal from the site. All treated magnesium dross waste materials must be removed on a regular basis. Records of waste removal shall be available upon request.

The permit holder projects that the rate of removal of placed wastes will continue to exceed the rate of waste disposal for the permit period. If off-site beneficial use rates do not exceed disposal rates on a calendar-year basis, the permit holder shall submit plans to construct a waste disposal unit compliant with 567 IAC 115.26(1)"d"(2).

- c. On a biennial basis beginning in 2016, the permit holder shall survey existing grades at the landfill site and compare the results to the final waste contours shown on Figure 2, Proposed Final Waste Contours, as contained in Appendix 9, Attachment A, of the Permit Application (Closure and Post Closure Plan). Using this information, the permit holder shall prepare and submit an estimation of the remaining airspace and landfill life biennially within the Annual Water Quality Report (AWQR)/Leachate Control System Performance Evaluation (LCSPE) Report.
- d. The permit holder shall collect leachate from the leachate control system and properly dispose of the leachate either by treatment in an on-site facility, discharge with an NPDES permit; or by discharge to the City of Creston publicly owned treatment works (POTW). If the discharge is to a POTW with a pretreatment program approved by the DNR, the discharge must comply with the terms and conditions of a local permit issued for the discharge by the POTW. If the discharge is to a POTW without an approved pretreatment program a completed treatment agreement form shall be submitted to the DNR's Wastewater Section. Copies of the local permit or treatment agreement shall be provided to the DNR's Solid Waste Section and the local Field office. The treatment agreement must be on DNR Form 31 (542-3221) and must comply with the requirements of subrule 64.3(5).

In addition, the permit holder shall monthly measure leachate head levels and elevations at all piezometers and record the volume of leachate collected and transported to the treatment works. Records of leachate contaminants testing required by the treatment works and any NPDES permit for on-site treated leachate discharges shall be maintained.

The leachate control system shall be operated and maintained in accordance with the approved permit documents. After implementation of the leachate control system, the permit holder shall routinely collect the necessary information and evaluate the effectiveness of the system in controlling the leachate. All documentation shall be

summarized in a LCSPE Report. Effective control shall be considered as maintaining compliance with maximum leachate head as defined in 567 IAC 115.26(11)"a"(1), achieving the lowest possible leachate head as required in 567 IAC 115.26(12)"b"(2), and maintaining surface and groundwater quality standards at compliance monitoring points.

The permit holder shall annually submit the LCSPE Report, including record data, as a supplement to the facility AWQR, as defined in 567 IAC 115.26(8)"d". The performance evaluation shall include proposed additional leachate control measures and an implementation schedule in the event that the constructed system is not performing effectively.

- e. Surface water shall be diverted around the fill area and surface drainage shall be provided at the toe of the working face.
 - f. The review comments, dated December 28, 2000 from the DNR's Conservation and Recreation Division relative to the comprehensive listing of plant and animal species, in accordance with for all development and soil borrow areas, are incorporated into the permit.
 - g. The review comments, dated July 27, 2001 from the State Historical Society relative to the determination of the presence of and assessment of the impact on any archaeological, historical, or architecturally significant properties for all development and soil borrow areas are incorporated into the permit.
 - h. The Emergency Response and Remedial Action Plan (ERRAP) as contained in Appendix 11 of the Permit Application in compliance with 567 IAC 115.30(455B) is approved. An updated ERRAP shall be submitted at the time of each permit renewal application and included with any request for permit modification to incorporate a facility expansion or significant changes in facility operation that require modification of the ERRAP.
3. The DNR authorizes the following alternative arrangement for reduction in fees owed for foundry sand and foundry composite wastes that are reclaimed from the landfill for beneficial use purposes.
- a. The difference between the amount (in tons) of foundry sand and foundry composite wastes reclaimed for beneficial use(s) from the landfill and the amount of new waste disposed of during a quarter shall be used to calculate what/if any fees are owed at the end of each quarter. If the amount reclaimed is equal to or greater than the amount disposed, no fees are owed for that quarter.
 - b. Beneficial use projects shall comply with the state's solid waste by-product beneficial use determination rules (IAC 567 Chapter 108) and be tracked and reported with each Quarterly Solid Waste Fee Schedule and Retained Fees Report including:
 - 1) Location of beneficial use(s)

- 2) Description of beneficial use(s)
- 3) Quantities used for each beneficial use project

The DNR shall have the sole authority to deny approval of a reported beneficial use if the proposed use is determined to have the primary purpose as a means of disposal, and any beneficial use would be incidental in nature.

- 4. Hydrologic monitoring at the site shall be conducted in accordance with the approved Hydrologic Monitoring System Plan (HMSP) as contained in Appendix 7 of the Permit Application; and the following:
 - a. The HMSP shall include upgradient groundwater monitoring points MW-7 and MW-8; downgradient groundwater monitoring points MW-11, MW-12, MW-13, MW-16, MW-17, MW-44, MW-45, MW-46, MW-47, MW-48, and MW-49; and downgradient surface water monitoring point SW-1.
 - b. Monitoring points MW-6, MW-9, MW-10, MW-14, MW-15, and MW-18 may be retained as water level measuring points.
 - c. DNR construction documentation form 542-1277 and boring logs for all monitoring wells and piezometers shall be submitted within 30 days of installation. DNR construction documentation form 542-1323 shall be submitted within 30 days of establishing surface water monitoring points.
 - d. Quarterly sampling of the approved monitoring points was completed in December 1993.

Continued routine semiannual sampling shall take place each year and be analyzed for the parameters listed in 567 IAC 115.26(4)"e". Routine annual testing for the parameters listed in 567 IAC 115.26(4)"f" shall be conducted each year.

Supplemental semiannual sampling and analysis for EPA Method 8260B volatile organic compounds (VOCs), fluoride, sulfate, aluminum, arsenic, beryllium, boron, cobalt, lithium, magnesium, manganese, nickel, and strontium shall be conducted in addition to the routine test parameters. All supplemental metal/metalloid analyses shall not be filtered and the analytical results must be reported as totals. The additional testing may be discontinued upon all of the following: **1)** The test results and a request for elimination of the additional sampling are submitted to the DNR; **and 2)** the DNR approves discontinuation of the additional sampling.

- e. Samples collected for total analyses shall not be filtered prior to laboratory analysis. Samples collected for dissolved metals analysis shall be field filtered, preserved, and promptly transferred to a certified laboratory for analysis.

- f. The Method Detection Limit (MDL) for the test parameters shall not exceed action levels as defined in 567 IAC Chapter 133 or Statewide Standards for a protected groundwater source as listed in 567 IAC 137. If the action levels cannot be feasibly achieved using procedures described in 567 IAC 115.26(5), then the MDL shall not exceed the lowest feasible level.
- g. Surface monitoring points must be clearly marked in the field and a method for measuring the flow rate at each sampling point shall be devised.
- h. An AWQR summarizing the effects the facility is having on groundwater and surface water quality shall be submitted to the DNR by January 31 each year. The AWQR shall include the results of the routine groundwater measurements conducted at the monitoring points and all groundwater sampling analysis and the associated DNR sampling forms 542-1322 and 542-1324. A copy of the report shall be sent to the designated EPA RCRA Project Manager for the site.
- i. Based on water quality standard exceedances for fluoride, magnesium, sodium, and sulfate at the monitoring points MW-7, MW-8, MW-11, MW-12, MW-13, MW-16, MW-17, and SW-1, a Groundwater Quality Assessment Plan was required on October 16, 1995. The Preliminary Groundwater Quality Assessment Report, dated July 15, 1996, and the Final Report, dated March 25, 1997, as submitted by Green, adequately addressed the assessment requirements defined in the DNR's February 19, 1996 letter.

In accordance with the February 18, 2015 DNR letter, delineation of the extent of groundwater contaminant plumes that exceed a health-based or Secondary Drinking Water Standard in excess of background concentrations has been required at the site.

- 5. In accordance with the variance approval dated December 7, 1994, the permit holder is exempt from monitoring and reporting methane gas levels in site structures and at the property boundary, as required by subrule 567 IAC 115.26(15)"b". Variance approval was based on the inert nature of the foundry sand waste deposited at this site.

However, in the event that methane gas is found to be present at the site, gas monitoring shall be immediately implemented.

- 6. The permit holder shall provide on-site scale facilities for the purposes of weighing and reporting solid wastes disposed of at the landfill. If conditions are such that make it impractical to provide an on-site scale, then off-site scale facilities or an alternative method to weighing may be used if justified and approved by the DNR. The permit holder shall comply with the waste weighing, record keeping and tonnage fee reporting requirements defined in 567 IAC 101.14(455B,455D). The scale weighing facilities shall comply with the certification and licensing requirements of the Iowa Department of Agriculture and Land Stewardship. Certification shall be maintained current at all times. The permit holder shall submit a copy of the weighing scale facility licensing certificate issued by the Iowa

Department of Agriculture and Land Stewardship and a copy of renewals shall be provided to the DNR.

7. The permit holder shall close the landfill site in accordance with the Closure and Postclosure Plan as contained in Appendix 9 of the Permit Application, and the following:
 - a. The review comments, dated June 16, 1994 from the Union County Soil & Water Conservation District relative to compliance with wind and soil loss limit regulations, in accordance with 567 IAC 115.26(1)"j" for all development areas, are incorporated into the permit.
 - b. Final cover contours based on the waste exhumation predictions shall be as shown on Figure 3, Proposed Final Cover Contours, as contained in Appendix 9, Attachment A of the Permit Application (Closure and Post Closure Plan).

APPENDIX B

**APPENDIX 9: A CLOSURE AND POSTCLOSURE PLAN IN ACCORDANCE WITH
SUBRULE 115.13(10); 115.26(10); AND 115.26(13) THROUGH 115.26(14)
Industrial, Captive, Monogenerator/Monofill Landfill
WDC Acquisition LLC
Creston, Iowa**

Special Provisions Nos. 1 and 2 of the current landfill permit dated January 24, 2018 read as follows:

1. The permit holder is authorized to accept foundry sand waste, baghouse/dust collector wastes, and treated magnesium dross waste generated by Wellman Dynamics Corporation in Creston, Iowa for disposal. Wastes disposed at this site shall not exhibit free liquids, toxic or hazardous properties. No hazardous wastes as defined by Iowa Code section 455B.411 may be disposed at this landfill.

In addition, the permit holder may use the workface as a drying/staging area for waste material prior to removal from the site during exhumation activities.

2. The permit holder shall develop and operate the site in accordance with the hereby approved Solid Waste Landfill Permit Application (Permit Application), dated March 18, 2015, as submitted by Penn Environmental & Remediation, Inc., and the following:
 - a. Waste disposal is limited to the existing waste boundary as shown on Figure 1 as contained in Appendix 9 of the Permit Application. Any further expansion beyond this waste boundary shall require prior Department approval.
 - b. The permit holder is authorized to exhume waste foundry sand and foundry composite wastes for reuse in accordance with the removal procedures contained in Appendix 3, 8 and Appendix 9 of the Permit Application. .

Care must be taken to drain excessive surface water ponding in the fill areas in order to minimize infiltration to groundwater, as generated leachate is not contained by an engineered liner or collected in a leachate collection system that underlies the entire disposal area, and groundwater contamination from the landfill has been documented. Failure to minimize ponding of surface waters in the fill areas may result in revocation of DNR Field Offices #4's June 18, 2004 approval to forego daily or intermediate cover, or the imposition of additional requirements to minimize infiltration.

The exhumation operations shall be conducted such that the permit holder shall maintain positive drainage at all times during the exhumation process. Dust shall be controlled at all times.

In addition, the permit holder may use the workface as a drying/staging area for the treated magnesium dross wastes prior to removal from the site. All treated

magnesium dross waste materials must be removed on a regular basis. Records of waste removal shall be available upon request.

The permit holder projects that the rate of removal of placed wastes will continue to exceed the rate of waste disposal for the permit period. If off-site beneficial use rates do not exceed disposal rates on a calendar-year basis, the permit holder shall submit plans to construct a waste disposal unit compliant with 567 IAC 115.26(1)"d"(2).

This Closure/Postclosure Plan reflects the special conditions listed above and anticipates those conditions will be included in the forthcoming permit renewal, with reference to the current permit renewal application.

[567 IAC – 115.13(10)] Closure/Postclosure Plan

- a. This Closure/Postclosure Plan, as described herein, has been submitted as part of this permit renewal application. The plan remains the same as presented in the March 2015 submittal, with the exception of minor revisions to the final waste and cover contours. The revisions provide additional cover near the buried thorium drum area to the west. No other permit revisions are requested at this time

(1) The WDC Landfill will be closed in accordance with the specifications listed in this plan and applicable regulations. The date of closure will be after the majority of the waste materials are removed from the landfill for offsite beneficial use. When the waste has been removed to the final waste contours shown in **Appendix 9, Attachment A**, WDC will close the landfill in the manner discussed below.

(2) See below for information regarding proposed monitoring plans and control systems.

(3) Contact information for the postclosure period:

Matt Thelen, Environmental Manager
WDC Acquisition LLC
1746 Commerce Road
Creston, IA 50801
Phone: 641-782-0283

- b. This Closure/Postclosure Plan, as described herein, has been submitted as part of this permit renewal application. The plan remains the same as presented in the March 2015 submittal, with the exception noted above.

[567 IAC – 115.26(10)] Postclosure Monitoring Requirements

- a. See below for information regarding proposed monitoring plans and control systems.
- b. IDNR will review postclosure monitoring records at 5-year intervals to determine if changes in monitoring frequency or parameters are required.
- c. Not applicable.

[567 IAC – 115.26(13)] Closure Requirements

WDC must close the site in a manner that minimizes the potential for postclosure release of pollutants to the air, groundwater, and surface waters.

- a. Currently, two survey markers have been established for the WDC, as shown on **Appendix 1, Attachment B, Plan Sheet 3**. Benchmark No. 1 (BM 1) is a spike in the power pole located northwest of the intersection of Osage Street and the WDC facility entrance, at an elevation of 1,250.53 feet above mean sea level (msl).

Benchmark No. 2 (BM 2) is a spike in the brace pole located about 30 feet southeast of the magnesium dross processing area at an elevation of 1,277.26 msl.

- b. Final Cover:

(1) Base layer will be not less than 2 feet of compacted soil. The permeability must be 1×10^{-7} cm/sec or less as determined by appropriate laboratory analysis. The percent of standard or modified proctor density at a moisture content consistent with expected field conditions and corresponding to a measured coefficient of permeability equal to or less than 1×10^{-7} cm/sec shall be determined in the laboratory. The soil shall be placed in lifts not to exceed 8 inches in thickness. A minimum of one field density test shall be performed per lift per acre to verify that the density determined by the laboratory analysis as correlated to permeability has been achieved. Results of field density tests shall be submitted to IDNR. The compacted soil shall be keyed into the bottom of the waste cell boundary.

(2) Cover layer will be not less than 2 feet of uncompacted soil, containing sufficient organic matter to support vegetation. The thickness of this soil layer must be at least the root depth of the planned vegetative cover to prevent root penetration into the underlying soil layers. This layer shall be placed as soon as possible to prevent desiccation, cracking and freezing of the compacted soil layer described above.

(3) A layer of compacted soil, incinerator ash, or similar material permitted by IDNR may be used to prepare the site for placement of the compacted soil layer described above. The use of such material will not serve as a replacement for the compacted soil layer.

- c. Not applicable.
- d. Not applicable – final cover has not been placed on the landfill to date.
- e. The final cover must have a minimum slope of 5 percent and a maximum slope of 25 percent. Site drainage will trend to the south and east and will consist of sheet flow to interceptor channels as noted in **Appendix 9, Attachment A**.
- f. The final cover shall be seeded with native grasses or other suitable vegetation as recommended by the local Natural Resources Conservation Service as soon as practicable upon completion to prevent soil erosion. If seeding must be delayed due to summer or winter conditions, silt fences or other structures shall be used to minimize erosion of the final cover until the next season suitable for planting. The placement of final cover as described above, shall not be delayed due to season and shall be placed as soon as the solid waste has reached its final elevation. Vegetation type shall be based on density and root depth, nutrient availability, soil thickness and soil type. Alternatives to vegetative cover may be considered to control erosion and prevent runoff.
- g. Refer to **Appendix 7, Attachment B** for the approved Hydrologic Monitoring System Plan.
- h. Refer to **Appendix 8** for the current Leachate Control System Plan.
- i. A Landfill Gas Monitoring Plan is not required for the subject landfill. Refer to **Appendix 10**.
- j. WDC has established a sinking fund to cover the costs of closure and postclosure. Information on this fund is provided to IDNR annually.
- k. All requirements of the closure plan, the closure permit, and the rules must be satisfied.

[567 IAC – 115.26(14)] Postclosure Requirements for 30 Years following Closure of the Site

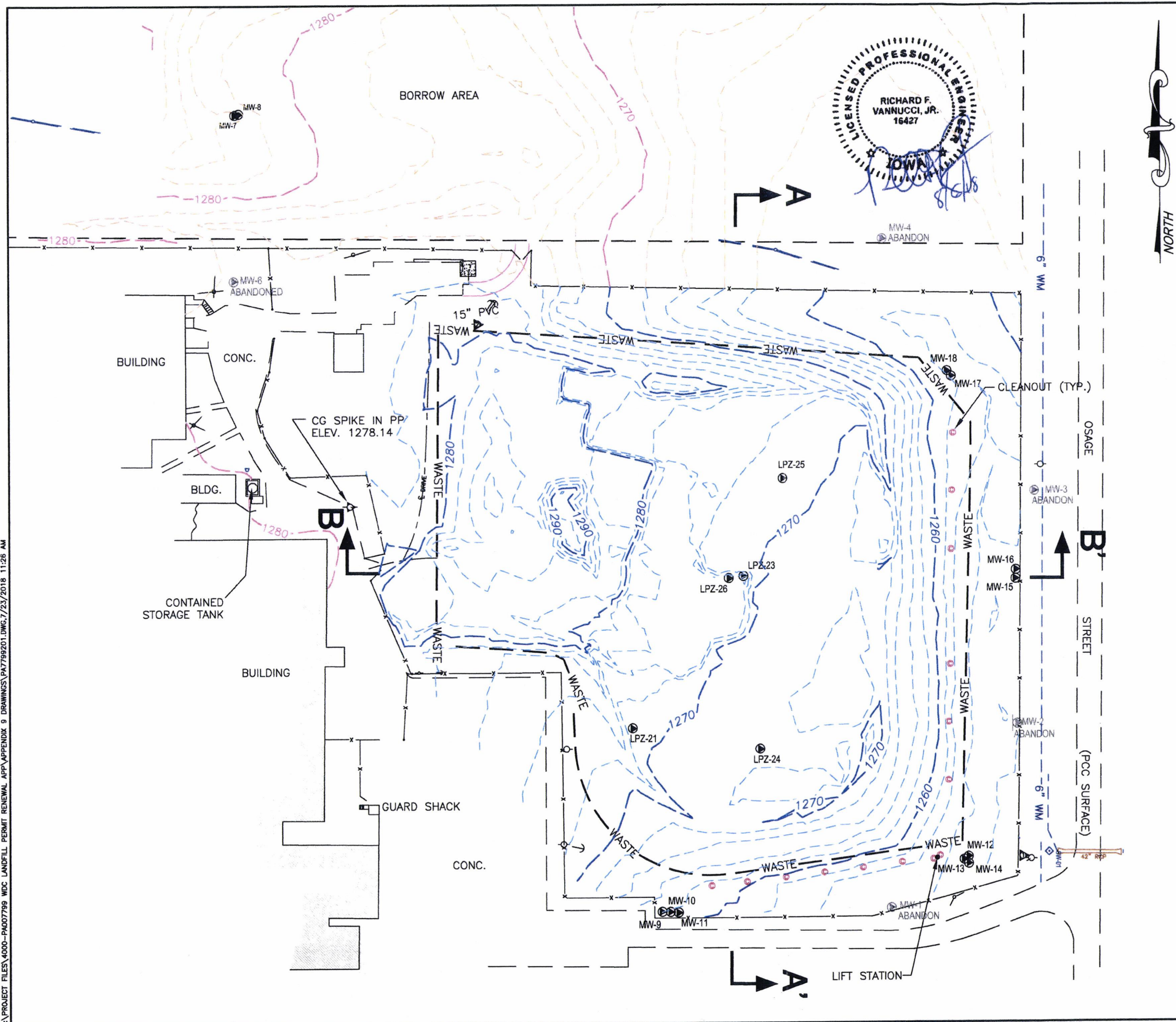
- a. The diversion and drainage system must be maintained to approved specifications to prevent run-on and runoff from eroding or otherwise damaging the final cover.
- b. The integrity and effectiveness of the final cover must be maintained by making repairs as necessary to correct the effects of settling, subsidence, erosion, a or other events. If damage to the compacted soil layer occurs, repairs shall be made to correct the damage and return to its original specifications.

- c. The vegetative cover shall be reseeded as necessary to maintain good vegetative growth. Any invading vegetation whose root system could damage the compacted soil layer shall be removed or destroyed immediately.
- d. Refer to **Appendix 7, Attachment B** for the approved Hydrologic Monitoring System Plan.
- e. Refer to **Appendix 8** for the current Leachate Control System Plan.
- f. A Landfill Gas Monitoring Plan is not required for the subject landfill. Refer to **Appendix 10**.
- g. Semiannual reports shall be submitted to IDNR. These reports shall contain information concerning the general conditions at the site, groundwater monitoring results, amount of leachate collected and treated, and other information as may be required by the closure permit. In addition, locations and elevations of all permanent monuments shall be determined at least once every three years or more frequently in the event of obvious disturbance of the monument. The reports are due by April 30 and October 31 for the preceding 6-month period.
- h. The permanent survey monuments shall be maintained.

APPENDIX 9
ATTACHMENT A

Closure and Postclosure Figures

S:\PROJECT FILES\4000-PA007799 WDC LANDFILL PERMIT RENEWAL APP\APPENDIX 9 DRAWINGS\PA7799201.DWG, 7/23/2018 11:26 AM



LEGEND

- LPZ-24 LEACHATE PIEZOMETER
- MW-17 MONITORING WELL
- MW-4 ABANDONED MONITORING WELL
- WASTE — APPROXIMATE LANDFILL BOUNDARY
- X — CHAIN LINK FENCE
- 1280 — EXISTING CONTOURS AS OF MARCH 4, 2011
- 1280 — EXISTING CONTOURS AS OF JUNE 13, 2018
- A A' CROSS SECTION LOCATIONS

NOTE:
REFER TO FIGURE 4 FOR SECTIONS A-A' AND B-B'.

REFERENCE:

1. SITE TOPOGRAPHY PROVIDED BY:
GARDEN & ASSOCIATES, LTD.
500 E. TAYLOR, SUITE C
CRESTON, IOWA 50801
PROJECT NO. 9018199
DATE: JUNE 13, 2018
2. BORROW AREA TOPOGRAPHY PROVIDED BY:
BAKER LEMAR ENGINEERING CONSULTANTS
1801 INDUSTRIAL CIRCLE
WEST DES MOINES, IA 50265
PROJECT NO. FNSTL. 11000
DATE: MARCH 4, 2011

SCALE - FEET



FIGURE 1
SITE PLAN - EXISTING CONTOURS

WDC ACQUISITION FACILITY
CRESTON, IOWA

PREPARED FOR
WDC ACQUISITION, LLC
CRESTON, IOWA

APPROVED RFV 07/20/2018

CHECKED RFV 07/20/2018

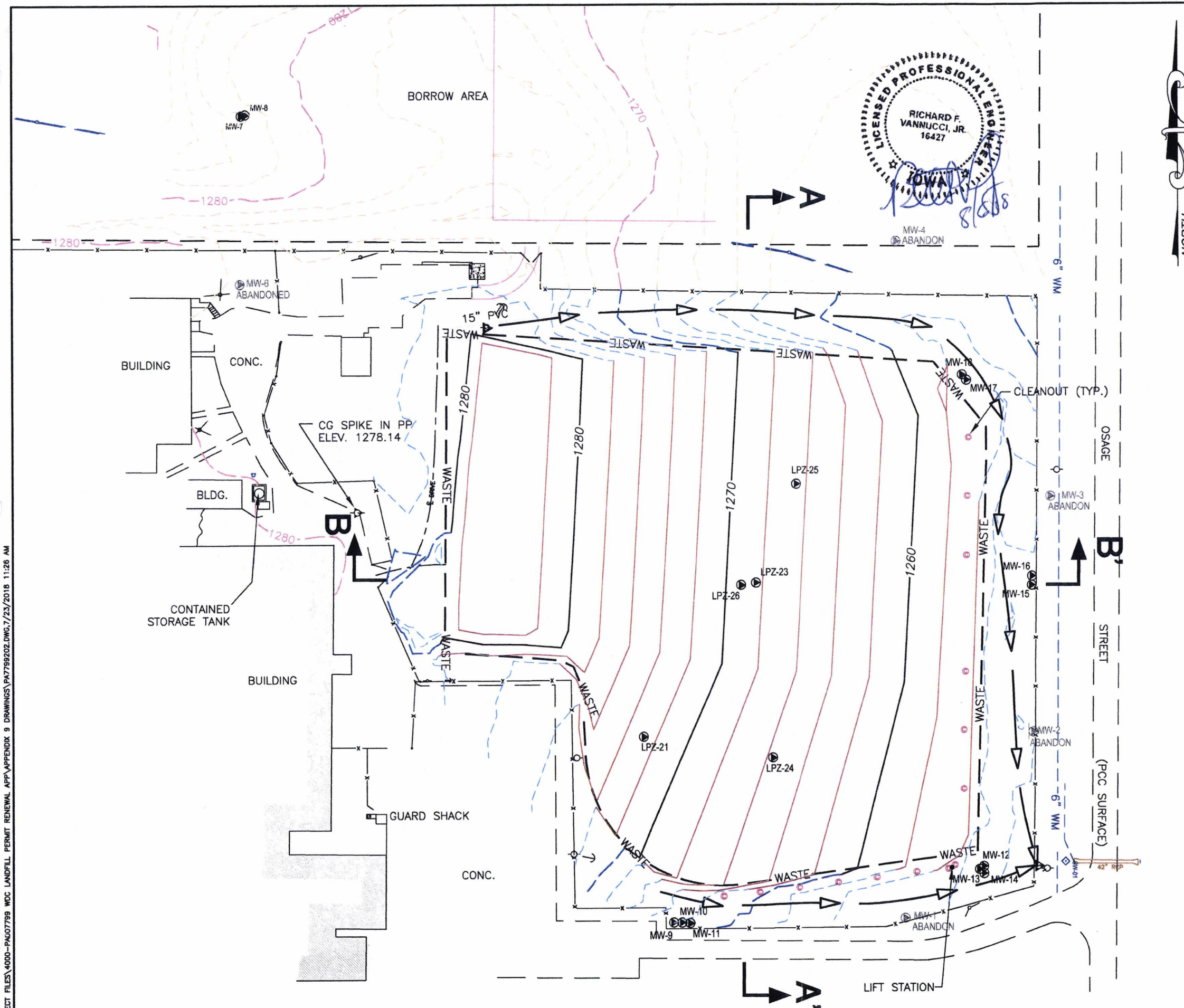
DRAWN EWB 07/13/2018

DRAWING NUMBER

PA7799201



Penn E&R
Environmental & Remediation, Inc.



MW-4
ABANDON

LEGEND

LPZ-24

LEACHATE PIEZOMETER

MW-17

MONITORING WELL

MW-4  ABANDON

ABANDONED MONITORING WELL

— WASTE

- APPROXIMATE LANDFILL BOUNDARY

- COLLECTION DITCH

- CHAIN LINK FENCE

—1255—

- PROPOSED FINAL GRADES

1280

EXISTING CONTOURS AS OF
MARCH 4, 2011

— — — 1280 —

EXISTING CONTOURS AS OF
JUNE 13, 2018

A A

CROSS SECTION LOCATIONS

NOTE:

REFER TO FIGURE 4 FOR SECTIONS A-A' AND B-B'.

REFERENCE:

1. SITE TOPOGRAPHY PROVIDED BY:
GARDEN & ASSOCIATES, LTD.
500 E. TAYLOR, SUITE C
CRESTON, IOWA 50801
PROJECT NO. 9018199
DATE: JUNE 13, 2018
2. BORROW AREA TOPOGRAPHY PROVIDED BY:
BAKER LEMAR ENGINEERING CONSULTANTS
1801 INDUSTRIAL CIRCLE
WEST DES MOINES, IA 50265
PROJECT NO. FNSTL. 11000
DATE: MARCH 4, 2011

SCALE - FEET



FIGURE 2
PROPOSED FINAL WASTE CONTOURS

WDC ACQUISITION FACILITY
CRESTON, IOWA

PREPARED FOR

WDC ACQUISITION, LLC
CRESTON, IOWA

APPROVED RFV 07/20/2018

CHECKED	RFV 07/20/2018
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CHECKED	RIV 07/26/2018
DRAWN	EWB 07/13/2018

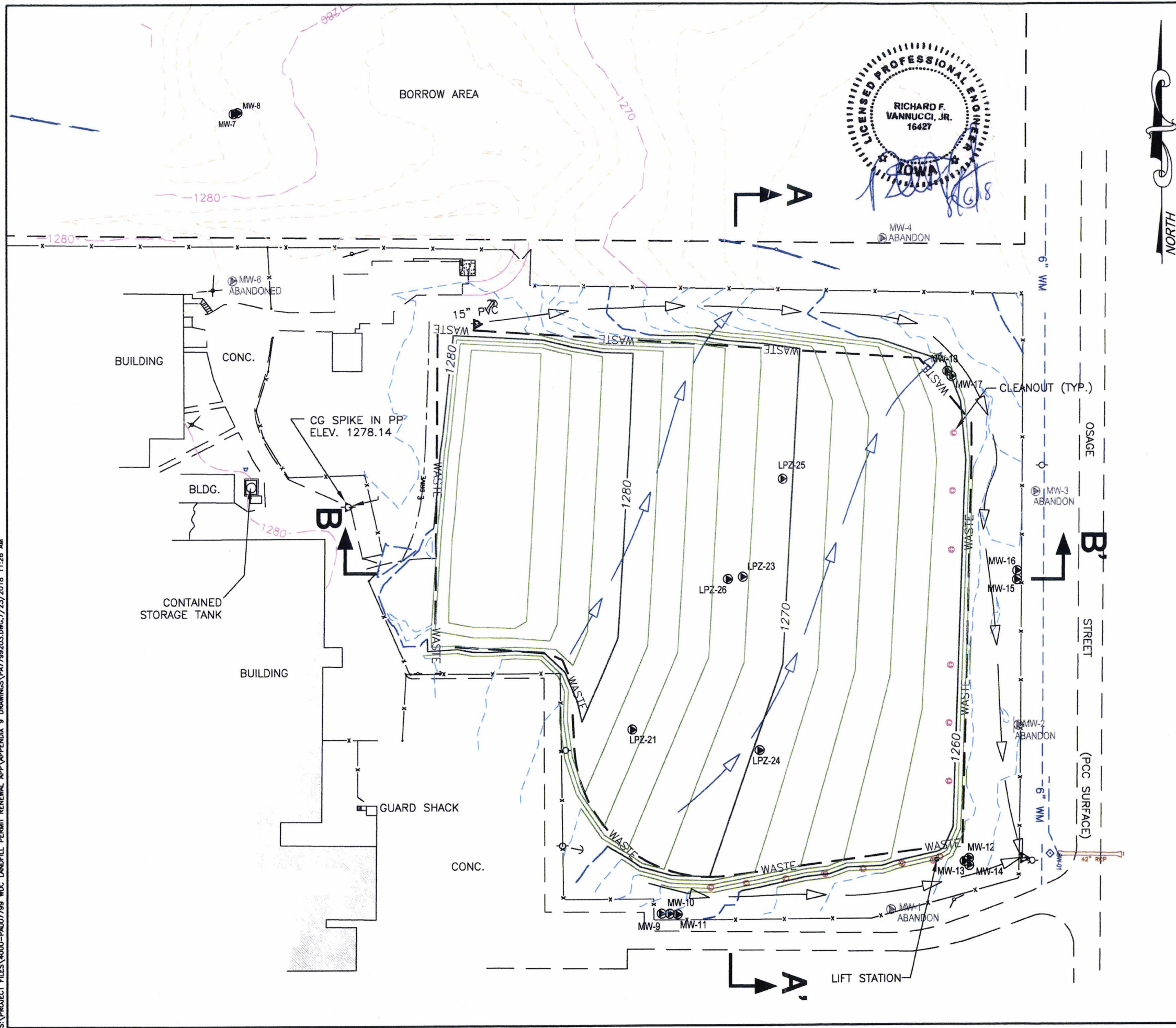
DRAWING NUMBER

PA7799202



Penn E&R
Environmental & Remediation, Inc.

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LEGEND

- LPZ-24 LEACHATE PIEZOMETER
- MW-17 MONITORING WELL
- MW-4 ABANDON ABANDONED MONITORING WELL
- WASTE APPROXIMATE LANDFILL BOUNDARY
- INTERCEPTOR DITCH
- COLLECTION DITCH
- CHAIN LINK FENCE
- 1255 PROPOSED FINAL COVER CONTOURS
- 1280 EXISTING CONTOURS AS OF MARCH 4, 2011
- 1280 EXISTING CONTOURS AS OF JUNE 13, 2018
- A A' CROSS SECTION LOCATIONS

NOTE:
REFER TO FIGURE 4 FOR SECTIONS A-A' AND B-B'.

REFERENCE:

- SITE TOPOGRAPHY PROVIDED BY:
GARDEN & ASSOCIATES, LTD.
500 E. TAYLOR, SUITE C
CRESTON, IOWA 50801
PROJECT NO. 9018199
DATE: JUNE 13, 2018
- BORROW AREA TOPOGRAPHY PROVIDED BY:
BAKER LEMAR ENGINEERING CONSULTANTS
1801 INDUSTRIAL CIRCLE
WEST DES MOINES, IA 50265
PROJECT NO. FNSTL. 11000
DATE: MARCH 4, 2011



FIGURE 3
PROPOSED FINAL COVER CONTOURS

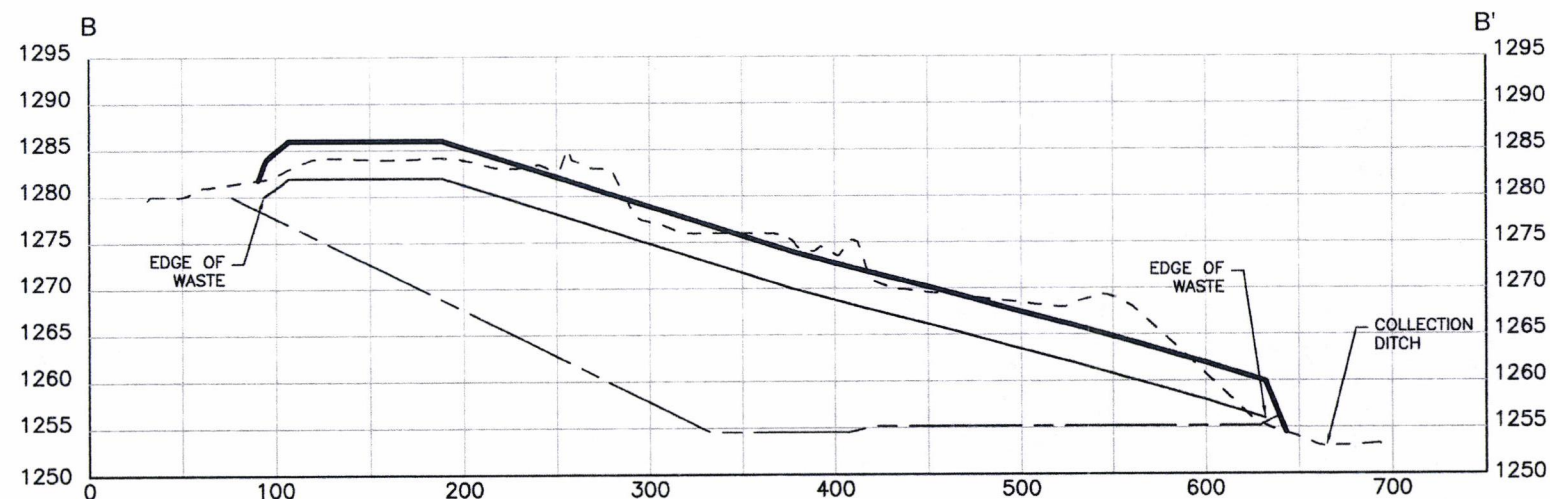
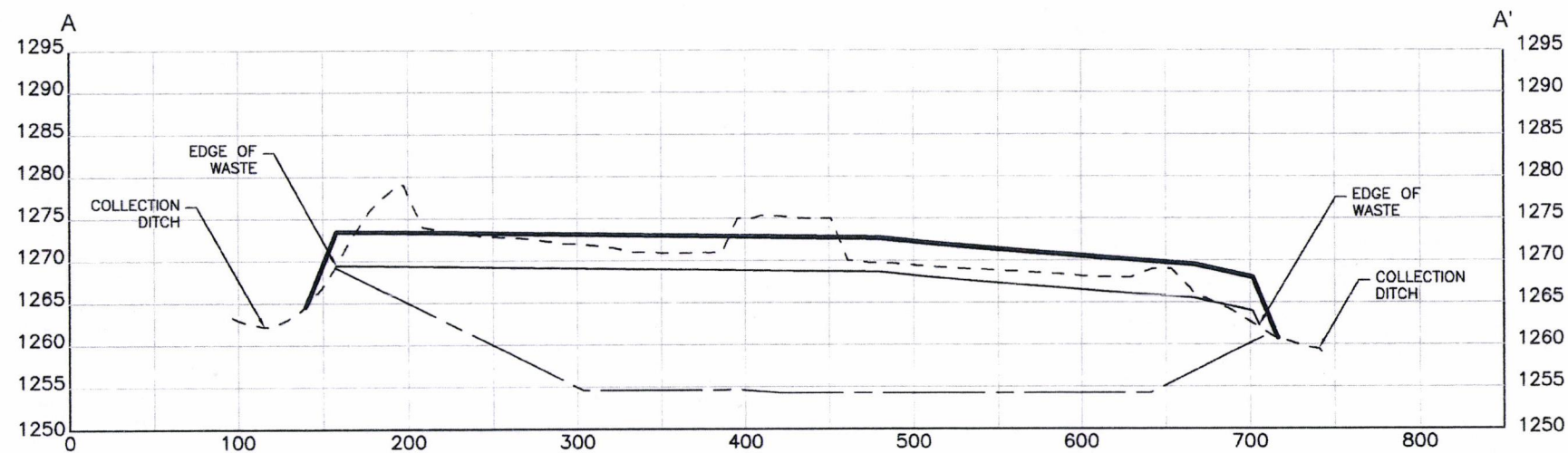
WDC ACQUISITION FACILITY
CRESTON, IOWA

PREPARED FOR
WDC ACQUISITION, LLC
CRESTON, IOWA

APPROVED RFV 07/20/2018
CHECKED RFV 07/20/2018
DRAWN EWB 07/13/2018
DRAWING NUMBER
PA7799203



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LEGEND

- EXISTING GROUND SURFACE
- FINAL COVER
- FINAL WASTE
- ESTIMATED BOTTOM OF WASTE

NOTE:
REFER TO FIGURES 1, 2, AND 3 FOR SECTION LOCATIONS.

REFERENCE:

1. SITE TOPOGRAPHY PROVIDED BY:
GARDEN & ASSOCIATES, LTD.
500 E. TAYLOR, SUITE C
CRESTON, IOWA 50801
PROJECT NO. 9018199
DATE: JUNE 13, 2018
2. BORROW AREA TOPOGRAPHY PROVIDED BY:
BAKER LEMAR ENGINEERING CONSULTANTS
1801 INDUSTRIAL CIRCLE
WEST DES MOINES, IA 50265
PROJECT NO. FNSTL. 11000
DATE: MARCH 4, 2011

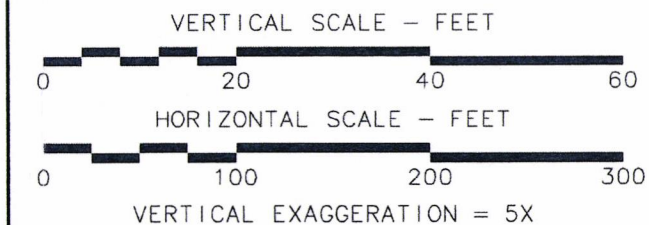
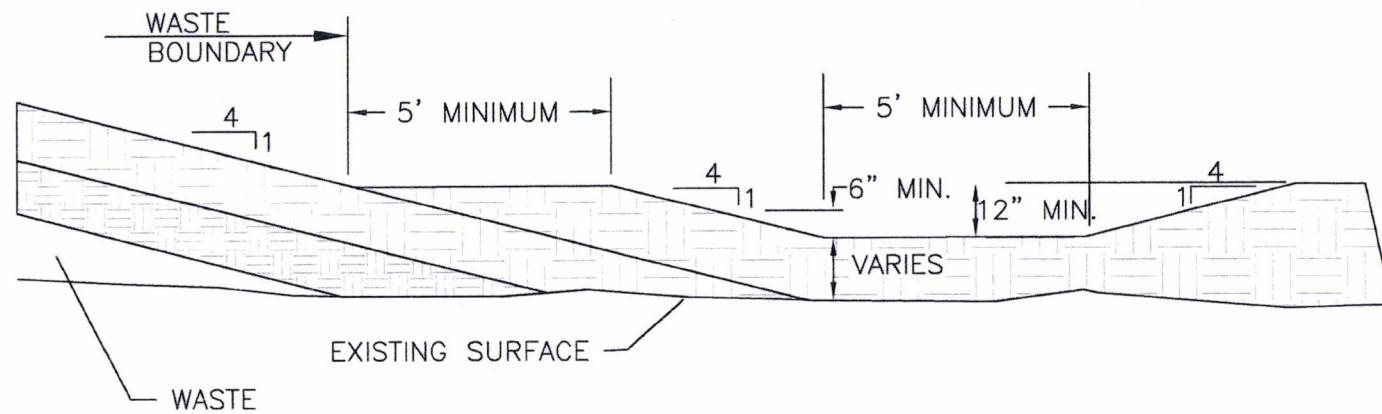


FIGURE 4
CROSS SECTIONS
A-A' AND B-B'
WDC ACQUISITION FACILITY
CRESTON, IOWA

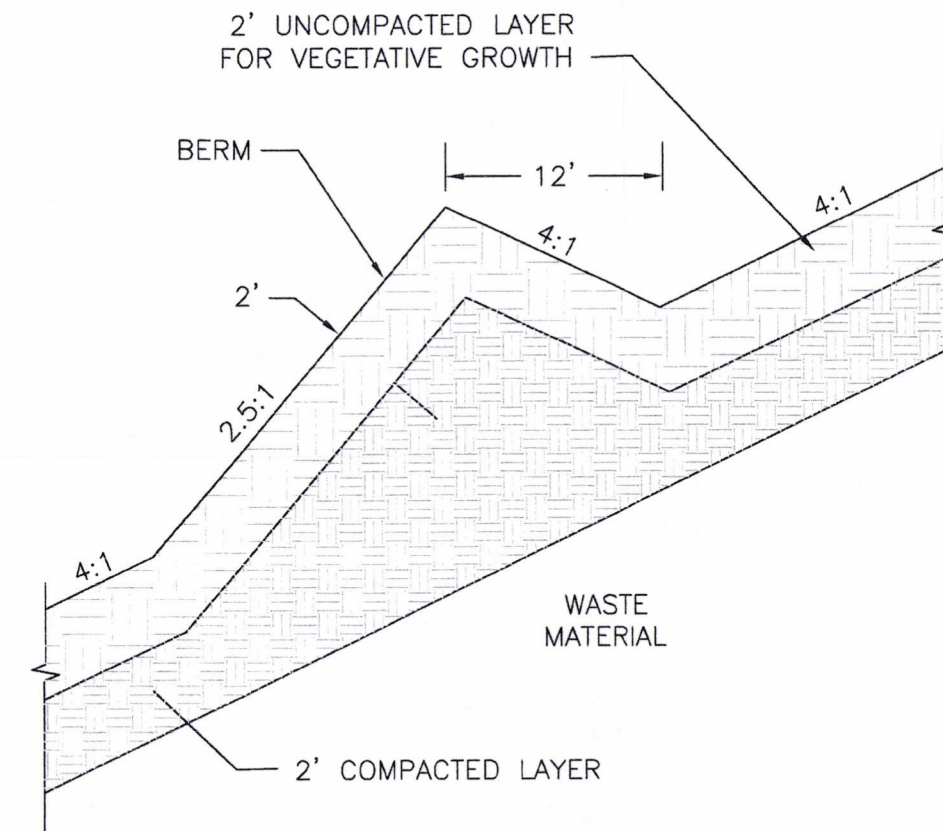
PREPARED FOR
WDC ACQUISITION, LLC
CRESTON, IOWA

APPROVED RFV 07/20/2018
CHECKED RFV 07/20/2018
DRAWN EWB 07/13/2018
DRAWING NUMBER
PA7799204

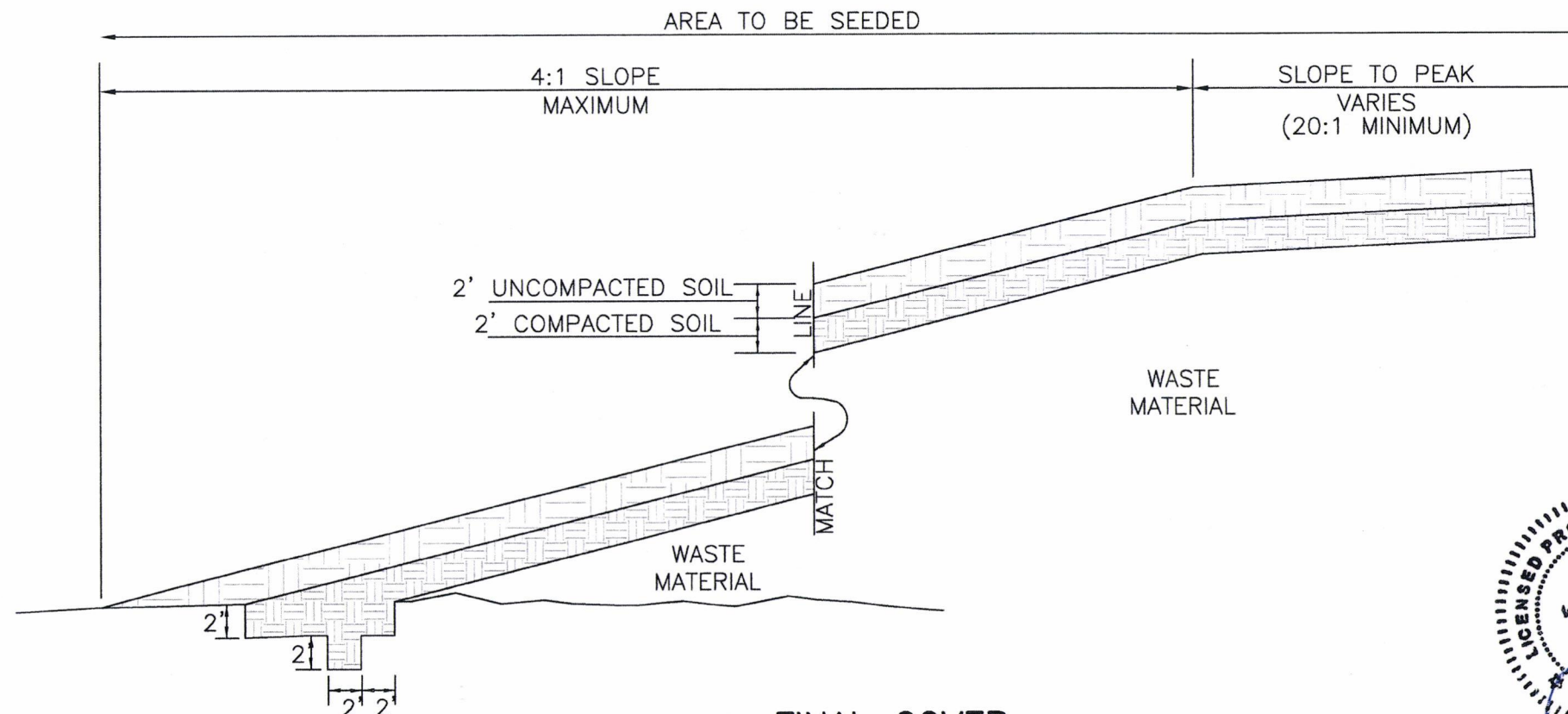




**TYPICAL SECTION
COLLECTION DITCHES**
NOT TO SCALE



**INTERCEPTOR DITCH
CROSS SECTION**
NOT TO SCALE



NOTE: KEY COMPACTED SOIL LAYER
OF FINAL COVER INTO NATURAL
SUBSOILS

FINAL COVER
NOT TO SCALE

REFERENCE:
GREEN ENVIRONMENTAL SERVICES, INC.
EXPANSION DETAILS SHEET 10, JOB NUMBER
709780J08/0660.



**FIGURE 5
DETAILS**

WDC ACQUISITION FACILITY
CRESTON, IOWA

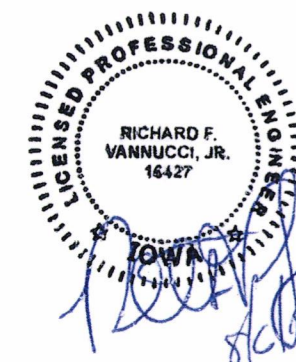
PREPARED FOR
WDC ACQUISITION, LLC
CRESTON, IOWA

APPROVED RFV 07/20/2018
CHECKED RFV 07/20/2018
DRAWN EWB 07/13/2018

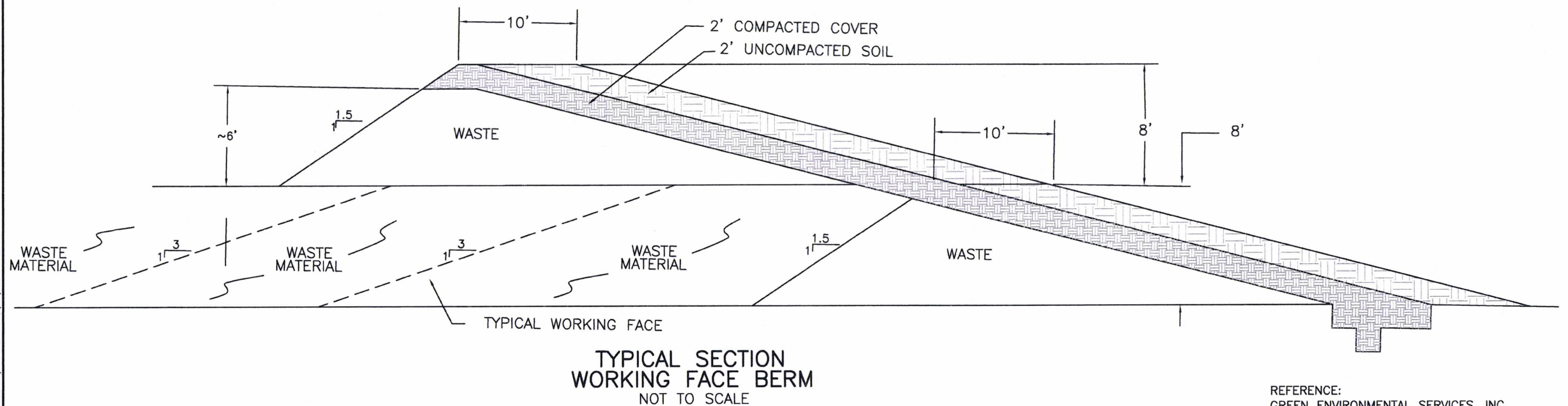
DRAWING NUMBER
PA7799205



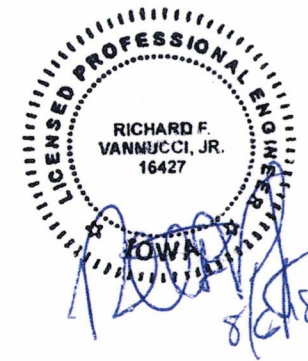
Penn E&R
Environmental & Remediation, Inc.



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REFERENCE:
GREEN ENVIRONMENTAL SERVICES, INC.
EXPANSION DETAILS SHEET 10, JOB NUMBER
709780J08/0660.



**FIGURE 6
DETAILS**

WDC ACQUISITION FACILITY
CRESTON, IOWA

PREPARED FOR
WDC ACQUISITION, LLC
CRESTON, IOWA

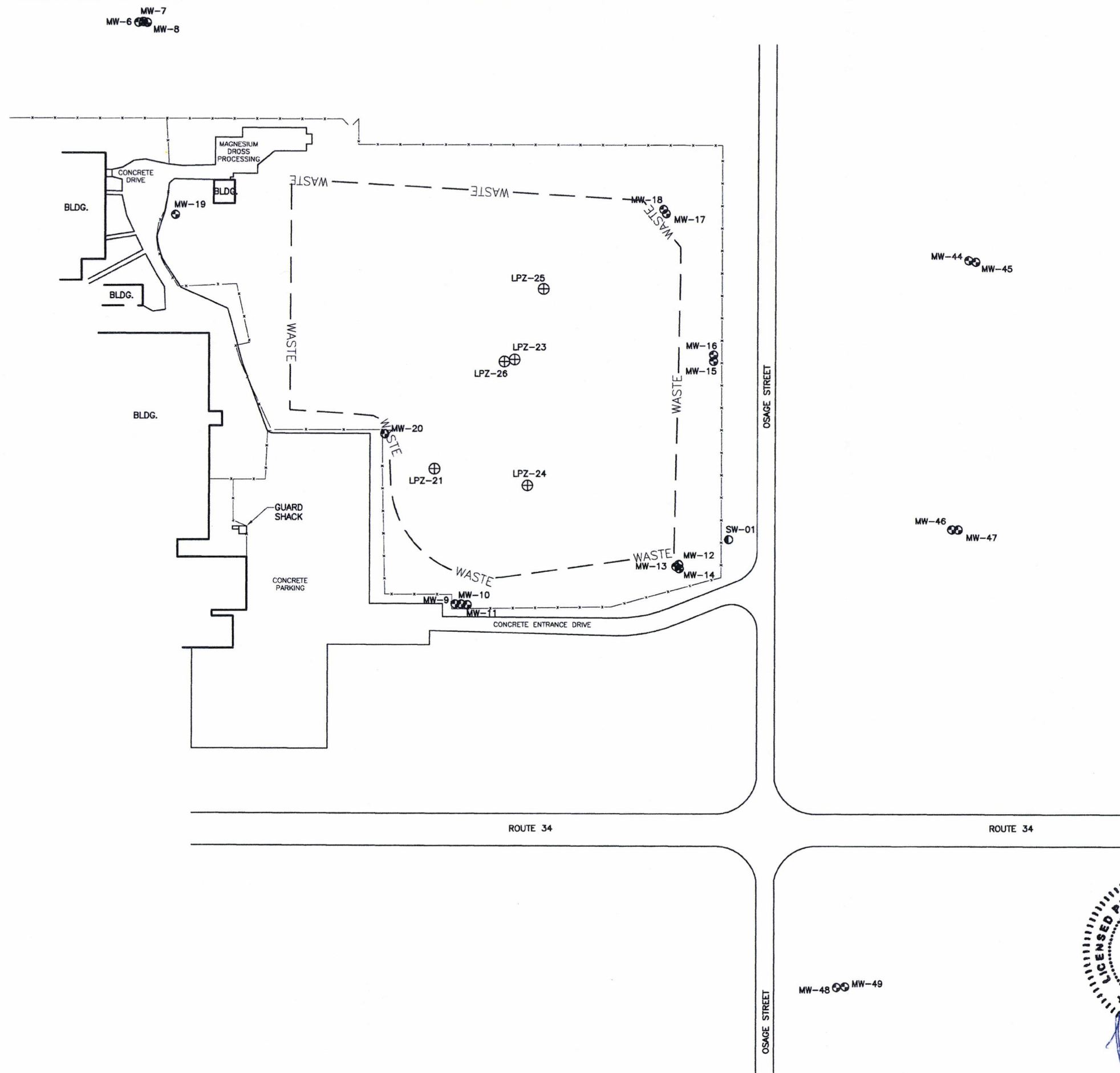
APPROVED RFV 07/20/2018
CHECKED RFV 07/20/2018
DRAWN EWB 07/13/2018

DRAWING NUMBER
PA7799206



Penn E&R
Environmental & Remediation, Inc.

S:\PROJECT FILES\4000-PA007799 WDC LANDFILL PERMIT RENEWAL APP\DRAWINGS\PA7799207 - WELL LOCATION MAP.DWG, 8/16/2018 3:38 PM



LEGEND

- SW-01 SURFACE WATER MONITORING POINT (APPROXIMATE LOCATION)
- MW-16 MONITORING WELL
- LPZ-21 LEACHATE PIEZOMETER
- WASTE APPROXIMATE LANDFILL BOUNDARY
- CHAIN LINK FENCE

REFERENCE:

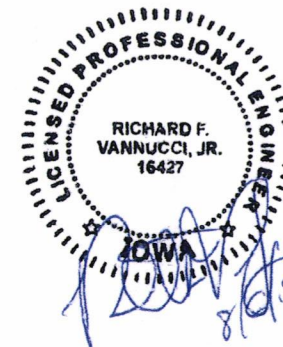
1. TAKEN FROM GREEN ENVIRONMENTAL SERVICES, INC. "HYDROGEOLOGIC INVESTIGATION REPORT" JANUARY 25, 1993.
2. TOPOGRAPHIC AND ELEVATION SURVEY BY GARDEN & ASSOCIATES, LTD., JUNE 13, 2018.



SCALE - FEET



REVISION	DATE	DESCRIPTION
FIGURE 7 WELL LOCATION MAP		
WDC ACQUISITION FACILITY CRESTON, IOWA		
PREPARED FOR WDC ACQUISITION, LLC CRESTON, IOWA		
APPROVED	RFV 08/06/2018	 Penn E&R Environmental & Remediation, Inc.
CHECKED	RFV 08/06/2018	
DRAWN	EWB 08/16/2018	
PROJECT NO. 4000-PA7799		
DRAWING NUMBER		PA7799207



APPENDIX C

CLOSURE

Third Party Closure Cost Estimate

Wellman Dynamics Corporation

Solid Waste Landfill Permit No. 68-SDP-44-88P

Completed by Penn Environmental and Remediation, Inc.

March 24, 2008 Rev. 1: March 2009; Rev. 2: February 2010; Rev. 3: March 2011; Rev. 4: March 2012; Rev. 5: March 2013; Rev. 6: March 2014; Rev. 7: March 2015; Rev. 8: March 2016; Rev. 9: March 2017

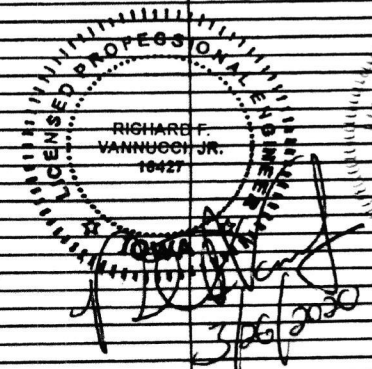
Rev. 10: March 2018; Rev. 11: March 2019; Rev. 12: March 2020

Factor No.	Description	Amount	Units	Cost/Unit	Cost	Notes/Assumptions	Reference
1	Closure and postclosure plan document revisions	1	LS	\$7,500	\$7,500	40 hrs. at \$130/hr. + admin. & exp.	Penn E&R est., 03/2008
2	Site preparation, earthwork, and grading	6	ACRE	\$4,500	\$27,000	Use finish grading cost as estimate for prep.	Means 08 31.22.16.10.1020
3	Drainage control culverts, piping and structures	2,750	LF	\$20	\$55,000	Avr. cost/LF; 1,020 LF Intercept, 1,730 LF divert.	Penn E&R est., 03/2008
4	Erosion control structures, sediment ponds and terraces	1	LS	\$45,000	\$45,000	Two sed. traps at \$12,500 ea. + 2,000 LF silt fence @ \$1/LF + 3 ac. matting @ \$5,000/ac.	Penn E&R est., 03/2008: Means 08 31.25.13.10.1000, Means 08 31.25.13.10.0100
5	Final cap construction	46,000	LCY	\$2.3	\$103,500	2 FT common + 2 FT clay; 46,000 LCY total with slope and contingency; assume on-site borrow; \$2.5/LCY clay, \$2.0/LCY common.	Local costs based on Baker Lerner 03/2008; Contact: Joe Herrick 515-258-8814
6	Cap vegetation soil placement	6	ACRE	\$10,000	\$60,000	Based on inflation adjusted past per acre costs.	Wellman 03/2008
7	Cap seeding, mulching and fertilizing	6	ACRE	\$1,000	\$6,000	No interim measures required.	Penn E&R est. 03/2008; Union County LF Cost Est.
8	Monitoring well, piezometer and gas control modifications	17	WELLS	\$400	\$6,800	13 wells + 4 piezometers, extension work.	Penn E&R est., 03/2008
9	Leachate system cleanout and extraction well modifications	1	SYS	\$15,000	\$15,000	Work to modify sump and clean outs, as req.	Penn E&R est., 03/2008
10	Monitoring well installations and abandonments	1	WELLS	\$1,250	\$1,250	Formally abandon LPZ-21.	Penn E&R est., 03/2008
11	Facility modifications to effect closed status	400	LF	\$20	\$8,000	Access roads per final plan, gravel surface.	Means 08 32.11.23.23.0302
12	Engineering and technical services	6	ACRE	\$7,500	\$45,000	QA of closure construction.	Penn E&R est., 03/2008
13	Legal, financial and administrative services	1	LS	\$5,000	\$5,000	Wellman estimate.	Wellman 03/2008
14	Closure compliance and certifications and documentation	1	LS	\$7,500	\$7,500	40 hrs. at \$130/hr. + admin. & exp.	Penn E&R est., 03/2008
Original Closure Cost Estimate Total					\$392,850		
2009 Inflation Adjustment (Inflation Factor = 1.018)					\$7,066		
2009 Closure Cost Estimate Total					\$399,916		
2010 Inflation Adjustment (Inflation Factor = 1.007)					\$2,797		
2010 Closure Cost Estimate Total					\$402,713		
2011 Inflation Adjustment (Inflation Factor = 1.013)					\$5,231		
2011 Closure Cost Estimate Total					\$407,945		
2012 Inflation Adjustment (Inflation Factor = 1.021)					\$8,881		
2012 Closure Cost Estimate Total					\$416,826		
2013 Inflation Adjustment (Inflation Factor = 1.0175)					\$7,284		
2013 Closure Cost Estimate Total					\$423,499		
2014 Inflation Adjustment (Inflation Factor = 1.01375)					\$5,827		
2014 Closure Cost Estimate Total					\$429,316		
2015 Inflation Adjustment (Inflation Factor = 1.0115)					\$5,109		
2015 Closure Cost Estimate Total					\$434,425		
2016 Inflation Adjustment (Inflation Factor = 1.0105)					\$4,735		
2016 Closure Cost Estimate Total					\$439,160		
2017 Inflation Adjustment (Inflation Factor = 1.01555)					\$6,873		
2017 Closure Cost Estimate Total					\$446,033		
2018 Inflation Adjustment (Inflation Factor = 1.0185)					\$8,284		
2018 Closure Cost Estimate Total					\$454,329		
2019 Inflation Adjustment (Inflation Factor = 1.02187)					\$9,582		
2019 Closure Cost Estimate Total					\$464,311		
2020 Inflation Adjustment (Inflation Factor = 1.0184)					\$7,615		
2020 Closure Cost Estimate Total					\$471,926		

Footnotes:

1) Original costs are in 2006 dollars.

2) The 2020 Inflation Factor is from INDR as of 1/30/2020.



POSTCLOSURE

Third Party Postclosure Cost Estimate

Wellman Dynamics Corporation

Solid Waste Landfill Permit No. 88-SDP-04-86P

Completed by Penn Environmental and Remediation, Inc.

March 24, 2008 Rev. 1: March 2009; Rev. 2: February 2010; Rev. 3: March 2011; Rev. 4: March 2012; Rev. 5: March 2013; Rev. 6: March 2014; Rev. 7: March 2015; Rev. 8: March 2016; Rev. 9: March 2017

Rev. 10: March 2018; Rev. 11: March 2019; Rev. 12: March 2020

Factor No.	Description	Amount	Units	Cost/Unit	Cost	Notes/Assumptions	Reference
1	General site facilities, access road and fencing maintenance	30	Years	\$250	\$7,500	400 LF road and 2,800 LF fence, 3 gates.	Penn E&R est., 03/2008
2	Cap and vegetative cover maintenance	30	Years	\$1,000	\$30,000	Mowing and misc repairs.	Penn E&R est., 03/2008
3	Drainage and erosion control systems maintenance	30	Years	\$500	\$15,000	2,750 LF channels.	Penn E&R est., 03/2008
4	Ground water to waste separation systems maintenance	30	Years	\$0	\$0	Not applicable.	Not applicable.
5	Gas control systems maintenance	30	Years	\$0	\$0	Not applicable.	Not applicable.
6	Gas control systems monitoring and reports	30	Years	\$0	\$0	Not applicable.	Not applicable.
7	Ground water and surface water monitoring systems maintenance	30	Years	\$500	\$15,000	Base and well head repairs.	Penn E&R est., 03/2008
8	Ground water and surface water quality monitoring and reports	30	Years	\$18,500	\$555,000	Includes sampling, analyses and reporting.	Wellman 03/2008
9	Ground water monitoring systems performance evaluations and reports	30	Years	\$0	\$0	Included in Item 8.	Not applicable.
10	Leachate control systems maintenance	30	Years	\$800	\$24,000	Clean out costs every three years, pump service.	Wellman 03/2008
11	Leachate management, transportation and disposal (See Footnote 3 for 2019 Adjustment.)	30	Years	\$2,000	\$60,000	1 MGY @ \$0.002/gal.; assume no haul. (See Footnote 3 for 2019 Adjustment.)	Creston ordinance 98.04
12	Leachate control systems performance evaluations and reports	30	Years	\$3,250	\$97,500	Based on 2008 estimate.	Penn E&R est., 03/2008
13	Facility inspections and reports	30	Years	\$7,600	\$228,000	Semiannual inspections req. in post closure.	Penn E&R est., 03/2008
14	Engineering and technical services	30	Years	\$500	\$15,000	Minimal services required.	Penn E&R est., 03/2008
15	Legal, financial and administrative services	30	Years	\$500	\$15,000	Minimal services required.	Penn E&R est., 03/2008
16	Financial assurance, accounting, audits, and reports	30	Years	\$500	\$15,000	Minimal services required.	Penn E&R est., 03/2008
Original Postclosure Cost Estimate Total				\$35,900	\$1,077,900		
2009 Inflation Adjustment (Inflation Factor = 1.016)					\$19,386		
2009 Postclosure Cost Estimate Total					\$1,096,386		
2010 Inflation Adjustment (Inflation Factor = 1.007)					\$7,678		
2010 Postclosure Cost Estimate Total					\$1,104,061		
2011 Inflation Adjustment (Inflation Factor = 1.013)					\$14,383		
2011 Postclosure Cost Estimate Total					\$1,118,413		
2012 Inflation Adjustment (Inflation Factor = 1.021)					\$23,467		
2012 Postclosure Cost Estimate Total					\$1,141,900		
2013 Inflation Adjustment (Inflation Factor = 1.0175)					\$18,983		
2013 Postclosure Cost Estimate Total					\$1,161,883		
2014 Inflation Adjustment (Inflation Factor = 1.01375)					\$15,988		
2014 Postclosure Cost Estimate Total					\$1,177,871		
2015 Inflation Adjustment (Inflation Factor = 1.0119)					\$14,617		
2015 Postclosure Cost Estimate Total					\$1,191,888		
2016 Inflation Adjustment (Inflation Factor = 1.0198)					\$12,992		
2016 Postclosure Cost Estimate Total					\$1,204,879		
2017 Inflation Adjustment (Inflation Factor = 1.01845)					\$16,856		
2017 Postclosure Cost Estimate Total					\$1,221,736		
2018 Inflation Adjustment (Inflation Factor = 1.0188)					\$22,761		
2018 Postclosure Cost Estimate Total					\$1,244,497		
2019 Inflation Adjustment (Inflation Factor = 1.02197)					\$27,386		
2019 Postclosure Cost Estimate Total					\$1,271,883		
2019 Postclosure Cost Estimate Total with Leachate Management Increase					\$1,484,883	(One time increase of \$211,000, see Footnote 3 below.)	
2020 Inflation Adjustment (Inflation Factor = 1.0164)					\$24,352		
2020 Postclosure Cost Estimate Total					\$1,509,235		

Footnotes:

1) Original costs are in 2008 dollars.

2) The 2020 Inflation Factor is from IDNR as of 1/30/2020.

3) 2019 Leachate Management Increase based on 2 MGY @ \$0.0047/gal = \$9,400/year for 30 years = \$282,000.

\$282,000 - \$71,000 (inflation adjusted \$60,000 original estimate) = \$211,000 Leachate Management Increase. (Source: WDC 3/2019)



APPENDIX D

WDC ACQUISITION LLC
PROPOSED BORROW AREA INVESTIGATION
PENN E&R PROJECT NO. PA008334

The purpose of this plan is to identify the presence and quantity of potentially suitable material in the proposed borrow area for the final cover system of the WDC Acquisition LLC (WDC) foundry waste landfill. The site immediately to the north of the landfill has been identified on the permit drawings as a potential borrow source for this cover system. The location of the proposed borrow area is depicted on **Attachment A**.

According to Appendix 9 of the permit application, the final cover system is to consist of a two-foot-thick layer of compacted clay with a maximum laboratory permeability of 1×10^{-7} cm/s. This laboratory permeability is to be correlated with a maximum standard or modified proctor density, which density specification will then be used in the field to verify compliance with the permeability specification during cap construction. This clay cap is to be overlain by a two-foot-thick layer of uncompacted soil capable of supporting vegetation. This proposed investigation is intended to assess the suitability and quantity of material in the proposed borrow area to supply these final cover requirements.

As part of a hydrogeological study by Green Environmental Services, Inc. (Green), boring logs were generated from the installation of monitoring wells in and around the landfill. These boring logs are included in **Attachment B**. These boring logs show that there is typically in the area a layer of loess or soil 1 to 5 feet thick, underlain by alluvial silt or glacial till. Laboratory values of the alluvial silt presented on the boring logs suggest that this material will have sufficiently low compacted permeability to meet the required specifications for the clay cap. The loess or soil may be suitable for the uncompacted cover. This proposed investigation will determine whether the area immediately to the north of the facility has sufficient quantity of material meeting the specifications for the compacted clay cap and uncompacted cover.

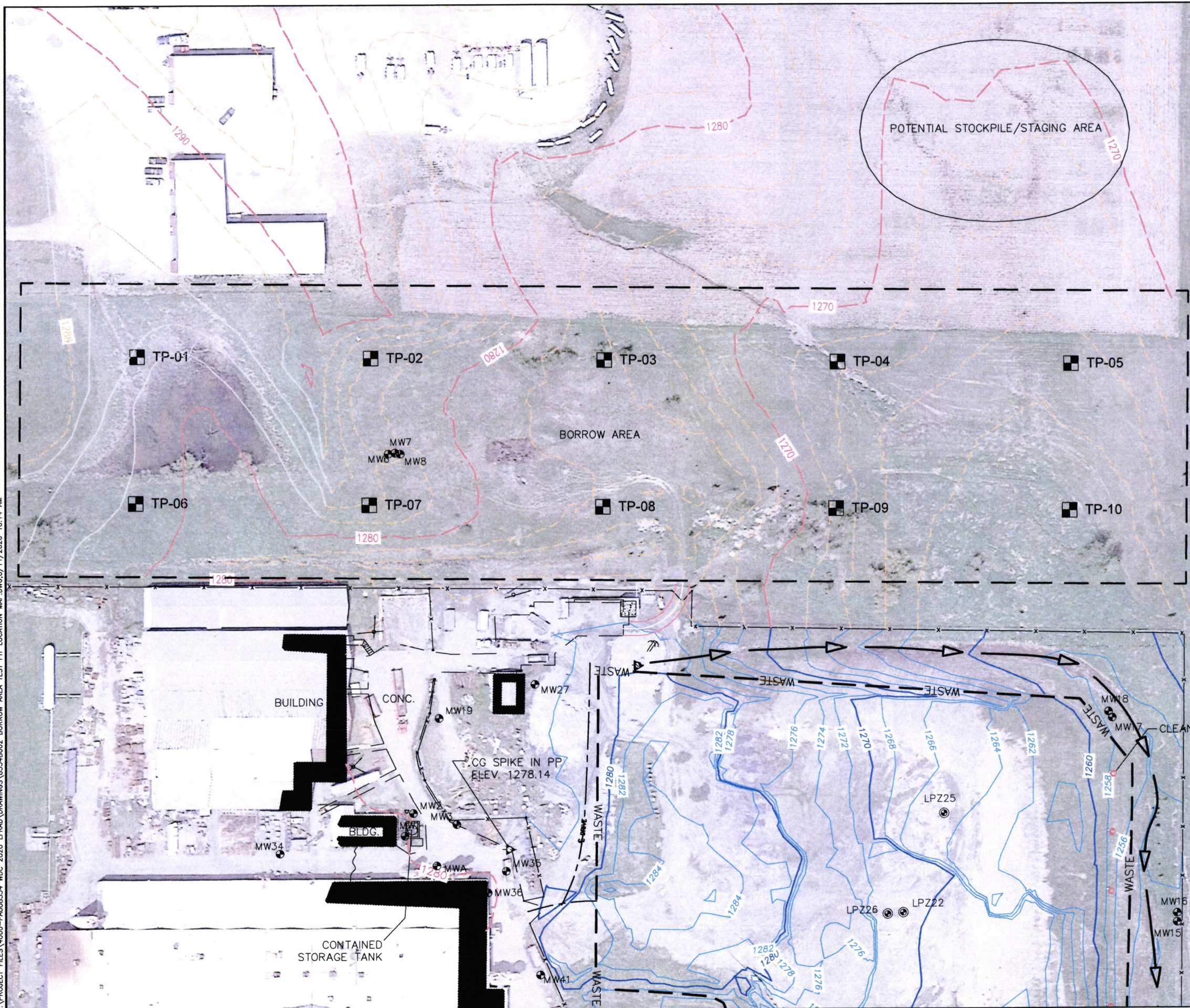
To evaluate the proposed borrow area for these material requirements, 10 test pits are proposed. The locations of the test pits are depicted on **Attachment A**. The test pits shall be a minimum of 7 feet deep in order to examine the soil/loess layer as well as the alluvial silt/glacial till layer. Bucket samples of each of these layers will be collected in each test pit and submitted to a geotechnical laboratory for analysis. The following tests will be run on the samples:

- Natural Water Content (ASTM D2216)
- Atterberg Limits (ASTM D4318)
- Grain Size Distribution (Sieve and Hydrometer) (ASTM D422)
- USCS Classification (ASTM D2487)
- Standard Proctor (ASTM D698)
- Permeability (ASTM D5084) (run on samples compacted to 95% standard proctor)
- Soil Fertility Test (soil/loess layer samples only)

The results of these laboratory analyses, as well as the test pit logs, will be used to estimate the quantity of suitable material for the final cover system available in the proposed borrow area, and therefore the suitability of the borrow area itself.

ATTACHMENT A
TEST PIT LOCATION MAP

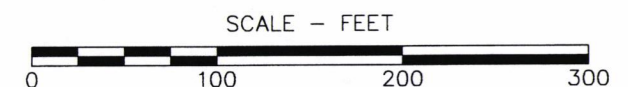
C:\PROJECT FILES\4000-PA008334 WDC 2020 LFRAD\DRAWINGS\8334B002 BORROW AREA TEST PIT LOCATION MAP.DWG,6/11/2020 10:14 AM



LEGEND

- TP-01 TEST PIT LOCATION
- MW7 EXISTING MONITORING WELL LOCATION
- ⊙ LPZ25 EXISTING PIEZOMETER LOCATION

TEST PIT LOCATIONS		
TEST PIT	NORTHING*	EASTING*
TP-01	384938.1	1408385.6
TP-02	384935.5	1408625.6
TP-03	384933.0	1408865.5
TP-04	384930.4	1409105.5
TP-05	384927.7	1409345.5
TP-06	384788.1	1408384.0
TP-07	384785.6	1408623.9
TP-08	384783.0	1408863.9
TP-09	384780.4	1409103.9
TP-10	384777.7	1409343.9
*IOWA STATE PLANE COORDINATE SYSTEM, SOUTH ZONE		

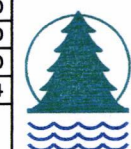


REVISION	DATE	DESCRIPTION
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ATTACHMENT A TEST PIT LOCATION MAP BORROW AREA INVESTIGATION WDC ACQUISITION FACILITY CRESTON, IOWA

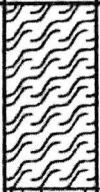

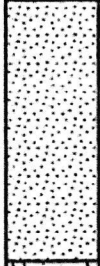


PREPARED FOR
WDC ACQUISITION LLC
CRESTON, IOWA

APPROVED RFV 06/09/2020
CHECKED RFV 06/09/2020
DRAWN EWB 05/29/2020
PROJECT NO. 4000-PA008334
DRAWING NUMBER
8334B002



Penn E&R
Environmental & Remediation, Inc.

ATTACHMENT B
BORING LOGS (GREEN)

CaCO ₃	K (cm/sec)	MW-8	MW-7	MW-6	DEPTH (feet)	LITHOLOGY	MATERIALS DESCRIPTION
-					0		0.0 to 5.0 LOESS Clayey silt. Yellow brown. Trace of organic material. Leached.
+		▼	▼	▼	5		
-					10		5.0 to 22.0 TILL Sandy silty clay. Rusty brown and gray, mottled. Minor caliche nodules.
-					15		
-					20		Yellow brown with gray mottles. Leached.
-					25		22.0 to 29.0 INTRATILL SAND LENS Fine to medium silty sand. Rusty orange and medium gray, mottled.
-	3 X 10 ⁻⁵ (In-Situ)				30		Fine to medium silty sand.
+					35		29.0 to 80.0 TILL Sandy silty clay with gravel. Medium brown. Unleached.
+					40		



**Green
Environmental
Services, Inc.**

PROJECT Fansteel Wellman Dynamics Landfill

PROJECT NUMBER 709780-J03

SURFACE ELEVATION 1288.9 Feet MSL

TOTAL DEPTH OF HOLE 80.0 Feet

LOG OF MW-6, MW-7, MW-8

WATER LEVELS ON 8-24-92

GEOLOGIST Jim Caldwell

CaCO ₃	K (cm/sec)	MW-8	MW-7	MW-6	DEPTH (feet)	LITHOLOGY	MATERIALS DESCRIPTION
+	2.3 X 10 ⁻⁹ (Laboratory)				45		Dark gray below 40.0.
+	7 X 10 ⁻⁸ (In-Situ)				50		
+					55		
+					60		
+					65		Fine to Medium-grained, thin sand lenses from 65.0 to 67.0.
+	2 X 10 ⁻⁸ (In-Situ)				70		
+					75		
+					80		



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PROJECT Fansteel Wellman Dynamics Landfill

PROJECT NUMBER 709780-J03

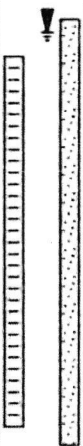






SURFACE ELEVATION 1288.9 Feet MSL

TOTAL DEPTH OF HOLE 80.0 Feet

LOG OF MW-6, MW-7, MW-8

WATER LEVELS ON 8-24-82

GEOLOGIST Jim Caldwell

CaCO ₃	K (cm/sec)	MW-11	MW-10	MW-9	DEPTH (feet)	LITHOLOGY	MATERIALS DESCRIPTION
-	1 X 10 ⁻⁴ (In-Situ)				0.0		0.0 to 3.0 SOIL Silty clay with plant fragments and other organic material. Medium brown. Leached.
+					5		3.0 to 12.0 TILL Sandy silty clay. Yellow brown. Minor clastic nodules.
-					10		12.0 to 12.5 INTRATILL SAND LENS Fine to medium sand. Rusty brown. Leached.
+					15		12.5 to 80.0 TILL Sandy silty clay with gravel. Yellow brown with gray mottles. Unleached.
+					20		Medium to dark gray.
+					25		
+					30		
+					35		
+					40		



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PROJECT Fansteel Wellman Dynamics Landfill

PROJECT NUMBER 709780-J03

SURFACE ELEVATION 1260.6 Feet MSL

TOTAL DEPTH OF HOLE 80.0 Feet

LOG OF MW-9, MW-10, MW-11

WATER LEVELS ON 8-24-92

GEOLOGIST Jim Caldwell

CaCO ₃	K (cm/sec)	MW-11	MW-10	MW-9	DEPTH (feet)	LITHOLOGY	MATERIALS DESCRIPTION
+	1×10^{-7} (In-Situ)				45		
+					50		
+					55		
+					60		
-					65		
+	3.1×10^{-10} (Laboratory)				70		
+					75		
+	1×10^{-7} (In-Situ)				80		
+							

Silt lens from 52.0 to 52.5.

Yellow brown with gray mottles. Leached.

Medium gray.



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PROJECT Fansteel Wellman Dynamics LandfillPROJECT NUMBER 709780-J03SURFACE ELEVATION 1260.8 Feet MSLTOTAL DEPTH OF HOLE 80.0 Feet

LOG OF MW-9, MW-10, MW-11

WATER LEVELS ON 8-24-92GEOLOGIST Jim Caldwell

CaCO ₃	K (cm/sec)	MW-13	MW-12	MW-14	DEPTH (feet)	LITHOLOGY	MATERIALS DESCRIPTION
-					0		0.0 to 5.0 SOIL Silty clay. Dark brown to black. Organic material. Leached.
-					5		
-					10		5.0 to 15.0 ALLUVIAL SILT Clayey silt with fine sand. Rusty brown with medium gray mottles. Leached.
-	4 X 10 ⁻⁵ (In-Situ) 2.3 X 10 ⁻⁸ (Laboratory)				15		
+					20		15.0 to 100.0 TILL Sandy silty clay with gravel. Rusty brown. Unleached.
+	4.2 X 10 ⁻⁹ (Laboratory)				25		Medium to dark gray.
+	5.1 X 10 ⁻⁹ (Laboratory)				30		Olive gray.
+					35		
+					40		



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PROJECT Fansteel Wellman Dynamics Landfill

PROJECT NUMBER 709780-J03

SURFACE ELEVATION 1251.8 Feet MSL

TOTAL DEPTH OF HOLE 100.0 Feet

LOG OF MW-12, MW-13, MW-14

WATER LEVELS ON 8-24-92


GEOLOGIST Jim Caldwell

CaCO ₃	K (cm/sec)	MW-13	MW-12	MW-14	DEPTH (feet)	LITHOLOGY	MATERIALS DESCRIPTION
+	2×10^{-7} (In-Situ)				45		Medium brown and medium gray, mottled. Minor caliche nodules.
+				50			
+				55			
+				60			
+	1×10^{-7} (In-Situ)			65			
+				70			
+	2.0×10^{-10} (Laboratory)			75			
+				80			

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PROJECT Fansteel Wellman Dynamics Landfill
 PROJECT NUMBER 709780-J03
 SURFACE ELEVATION 1251.8 Feet MSL
 TOTAL DEPTH OF HOLE 100.0 Feet

LOG OF MW-12, MW-13, MW-14
 WATER LEVELS ON 8-24-92
 GEOLOGIST Jim Caldwell

CaCO ₃	K (cm/sec)	MW-13	MW-12	MW-14	DEPTH (feet)	LITHOLOGY	MATERIALS DESCRIPTION
+					85		
+					90		
+					95		
+					100		
					105		
					110		
					115		
					120		



**Green
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PROJECT Fansteel Wellman Dynamics Landfill

PROJECT NUMBER 709780-J03

SURFACE ELEVATION 1251.8 Feet MSL

TOTAL DEPTH OF HOLE 100.0 Feet

LOG OF MW-12, MW-13, MW-14

WATER LEVELS ON 8-24-92

GEOLOGIST Jim Caldwell

CaCO ₃	K (cm/sec)		MW-16	MW-15	DEPTH (feet)	LITHOLOGY	MATERIALS DESCRIPTION
-			▼	▼			0.0 to 1.0 SOIL Black clayey soil. Rich in organics.
-					5		1.0 to 17.5 SILTY ALLUVIUM Gray, brown, black mottled clay-rich alluvium. A little organic material (5 to 8 %). Oxidized zones around subhorizontal fractures. 3 to 10 cm fracture interval.
-	4.9 X 10 ⁻⁵ (In-Situ)				10		Transition to light brown and gray, mottled color.
-					15		Light gray. 10 cm thick oxidized lens.
+	2.4 X 10 ⁻⁷ (Laboratory)				20		8 cm thick channel lag at base of alluvium.
+					25		17.5 to 35.0 TILL Light brown clay-rich till. Trace of gravel (2%). A little sand (6 to 10 %). Large igneous pebbles found every 2 to 5 feet, ranging 10 to 20 mm in diameter. Sand and gravel content increases downward. No fractures evident. Unleached. Gray mottles increase downward.
+					30		Lime content increases downward. Dark gray. Significant amount of limestone sand and gravel present from 27.5 to 30.0 (ranging 0 to 15 mm in diameter).
+	2.3 X 10 ⁻⁷ (In-Situ)				35		No sample.
					40		



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PROJECT Fansteel Wetman Dynamics Landfill

PROJECT NUMBER 709780-J03

SURFACE ELEVATION 1253.0 Feet MSL

TOTAL DEPTH OF HOLE 38.0 Feet

LOG OF MW-15, MW-16

WATER LEVELS ON 8-24-92

GEOLOGIST Greg Brennan

CaCO ₃	K (cm/sec)		MW-17	MW-18	DEPTH (feet)	LITHOLOGY	MATERIALS DESCRIPTION
-							0.0 to 1.0 SOIL Black clayey soil. Rich in organics (15%).
-					5		1.0 to 13.5 ALLUVIAL SILT Clay-rich flood plain deposits. Black with a trace of organics (5%). Transition to light brown. Grain size increases slightly with depth, but still predominantly clay.
-	9.6 X 10 ⁻⁶ (In-Situ)				10		Gray, trace of black, mottled. Gravel present.
+	4.4 X 10 ⁻⁹ (Laboratory)				15		13.5 to 35.0 TILL Dull gray clayey till with a little sand. Unleached.
+					20		5 mm thick silver-gray seam running nearly vertically through core from 18.0 to 19.5. Grain size distribution doesn't appear significantly different from matrix of the till. Unleached.
+					25		Sand content increases. Dull gray clayey till with a little sand. No fractures apparent. Fairly homogeneous lithology and color from 25.0 to 35.0.
+	5.4 X 10 ⁻⁸ (In-Situ)				30		
					35		No sample.
					40		



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PROJECT Fansteel Wellman Dynamics Landfill

PROJECT NUMBER 709780-J03

SURFACE ELEVATION 1258.8 Feet MSL

TOTAL DEPTH OF HOLE 38.0 Feet

LOG OF MW-17, MW-18

WATER LEVELS ON 8-24-82

GEOLOGIST Greg Brennan